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NETWORK

THE RAILWAYS OF AUSTRALIA QUARTERLY

- Rail Inventions that Excite World Interest
- NSW on a Fast Track to the 21st Century
- Keeping the Lines Open in the Big Wet

NETWORK

THE RAILWAYS OF AUSTRALIA QUARTERLY

Volume 28, Number 2
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COVER: A dramatic picture of Australian National's rail grinder at work on the trans-continental line. The result of continuing maintenance such as this sophistication means smoother, quieter travel, more safely at higher speeds. The famous Indian-Pacific which uses the line is destined for a refurbishing program to place it among the world's best for passenger comfort and service.

CONTENTS

Continuous tamping ...

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Plasser 09-32 CAT purchased by C.M.M. (Hamersley Iron Project)

PA215

Those Inventive Australians

Two great rail developments by Australians are attracting keen interest around the world. One is a rail flaw detection vehicle from the west, and the other, from the opposite side of the continent, is a new device which automatically alerts track maintenance workers to approaching trains. The Western Australian rail flaw detection (RFD) vehicle uses ultrasound signals to detect flaws, cracks and holes in railway lines and will soon be in operation on the Japan Railways east network.

Manufactured by Gemco at its Osborne Park factory, it is an example of a growing demand from Asia for Australian high technology rolling stock and equipment.

Mitsui Australia Pty Ltd recently accepted the $2.5 million vehicle on behalf of JR East at a special handover ceremony in Perth. ►

NETWORK

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- *State Rail Authority of New South Wales*
- *Public Transport Corporation – Victoria (V/Line & THE MET)*
- *Western Australian Government Railways (Westrail)*

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The only requirement of contributions to Network is that they be informative or entertaining and that their subjects be relevant to the wide interests of railway people today. Where viewpoints are contrary to those of the editor or Railways of Australia, we must accept that these differences are an essential element of a lively and interesting magazine.

They're showing how

The Electronic Flagman (lower) early-warning system and (right) the Rail Flaw Detection vehicle.

Deputy WA Premier, Ian Taylor said the sale represented a key technological and export breakthrough for Gemco.

"The RFD vehicle is the most sophisticated built by Gemco and, hopefully, will open doors to an export industry for Western Australia," he said.

The 40-tonne railcar is 15 metres in length and weighs in excess of four tonnes. It is a dual-gauge vehicle and can be driven from either end. This was the first vehicle of its kind to be designed and manufactured by Gemco, and the company was required to integrate both complex engine and drive systems to ensure the vehicle met stringent Japanese performance and quality specifications.

The on-board ultrasound equipment is a highly-advanced computer-based system which detects flaws and holes in railway lines as the vehicle travels at speeds of up to 80 km/h. Details of flaws are fed into a computer for high-speed processing, which activates a marking system, spraying paint on the line to identify location of the flaw.

The RFD vehicle also incorporates liteslice technology, a system which measures rail profile to check for wear. This involves firing powerful "slices" of light on to the rail 30 times each second to measure the quality of the rail.

The system was developed by Gemco in conjunction with the Australian Commonwealth Scientific and Industrial Research Organisation. Research costs to develop it exceeded $3 million.

Steve Beere, Gemco's Commercial Manager said the company was relying heavily on future export orders to recover the high investment cost in RFD technology. "The sale to JR East is considered a major breakthrough for our company," he added.

Track Warning System

An invention which alerts railway work gangs to the danger of approaching trains has secured its first sale in Australia amid intense interest from State and overseas rail networks.

Queensland Railways, which has had two employees killed by trains in recent years, has ordered eight of the fail-safe Electronic Flagman automatic warning systems..

The system has an estimated $5 million domestic market while developers estimate potential export sales to the United Kingdom alone could be worth as much as $15 million. British Rail has already expressed interest.

The Electronic Flagman is a joint venture between Adelaide-based

he world
t is done

THE ISOLATION WHICH FORCED AUSTRALIANS TO BECOME INNOVATIVE IN THE EARLY YEARS OF EUROPEAN SETTLEMENT IS GONE. BUT, THE INVENTIVE TRAIT LIVES ON AS THESE EXAMPLES PROVE.

elemetry and centralised train control specialist, Teknis Systems (Australia) Pty Ltd and Queensland Railways. It has taken three years to develop at a cost of $650,000.

The National Procurement Development Scheme provided grant assistance because of the Flagman's commercial prospects internationally.

The system uses a series of radio-linked sensors to alert work gangs well in advance of an approaching train. It replaces cumbersome, costly and less efficient manual warning systems such as human flagmen, detonators and speed indicator boards placed alongside tracks under repair.

Teknis Systems Managing Director, Mr Julian Smith, said: "The Electronic Flagman's extremely high safety factor for track workers has attracted enormous domestic and international interest. The self-contained operation provides reliable fail-safe early warning of trains entering active work areas so that track workers can move clear."

Doppler radar remote detector units located from two to six kilometres away on either side of a repair site are linked via UHF radio with a master unit at the work area.

Sirens and flashing lights on the master unit are activated when a train approaches, giving up to three minutes warning depending on the speed of the train and location of the remote detectors. There are also portable alarm beacons for repair crew members working up to 50 metres from the central repair point.

The Flagman proved so successful in trials that rail authorities in New South Wales instigated immediate test demonstrations and more are scheduled shortly in Victoria, South Australia and Western Australia.

During six weeks of trials with Queensland Railways, the Electronic Flagman handled 1500 train passages in a variety of conditions. Queensland

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2. "C" class 2240 kW supplied to V/Line. The first locomotive in Australia fitted with isolated cab to reduce noise levels for driver comfort.

3. "BL" class 2240 kW, the first Super Series locomotive on Australian National's system.

4. SD50 supplied to Hamersley Iron. These 190 tonne locomotives have 2840 kW traction with Super Series wheel slip control and are the first General Motors domestic locomotives to operate in Australia.

5. Melbourne's first modern electric suburban train. Fifty-five six car 'Silver Trains' were built by Clyde in collaboration with Hitachi for the 1500 volt DC rail system.

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A rail flaw vehicle (RFD) (above) is loaded on a flat-top for shipment to Japan. The interior view shows ultrasound and liteslice equipment.

Railways's Group General Manager, Corporate Services, Mr Tony Drake, said the Flagman functioned perfectly throughout.

"All required faults were simulated to ensure alarms were given when batteries ran flat or when the remote units were knocked over or tampered with," Mr Drake said.

"The trials also achieved increases in the signal distance and a reduction in the system's total weight from 103 kilograms to 26 kilograms.

"Queensland Railways regards the Electronic Flagman as a unique world-class product and we will provide strategic marketing support for it," Mr Drake said.

The influential International Heavy Haulage Association has invited Teknis to present a paper on the Flagman at its annual world workshop in Vancouver, Canada, in June. The system will be exhibited at the Urban Transport Show in New Zealand. Teknis Systems plans to market the Electronic Flagman throughout South East Asia, Canada, the United States and Britain.

Stand for hole-borer

The Victorian Transport Corporation Krong Vale mobile track gang has invented a stand for a hole-boring drill which reduces manual handling.

Supervisor Gerald Godfrey, Shane Forest and Occupational Health and Safety Adviser Peter Pianta were responsible.

The gang identified the handling of the "Stihl Borer" used for drilling holes in sleepers, as their most important manual handling concern.

The borer had to be constantly picked up and put down creating a high risk of back injury, the possibility of a repetitive injury, and the expense of having the machine repaired if it were dropped frequently.

The gang's solution is a "Stihl Borer Stand." The group came up with the basic design for the stand and then liaised, through the project officer, with the Bendigo Workshops and engineers who assisted them to fine-tune their initial design.

The stand is being used now in a number of other areas throughout the PTC. □

LUXURY

THE CONTURA CONFERENCE AND TOURIST CAR IN NSW

Luxurious conference facilities on rail are now available for hire in New South Wales with City Rail's introduction of the Contura conference car in a bid for more of the convention and tourist market.

So far this new business venture has proved very successful.

In its first three months the car has hosted hundreds of international tourists, a Blue Mountains tourist promotion trip, and 300 media and invited guests for the lavish opening of the El Caballo Blanco tourist resort.

To charter the Contura for a day costs about $2,000.

The Contura is a converted 16-year-old electric InterCity carriage which has its top deck extensively refurbished and restyled into a comfortable lounge area. The deep leather chairs facing the big panoramic windows, give passengers an unparalleled veiw.

The lounge will seat around 25 people in comfort, and is designed to be an ideal setting for small conferences, product launches and business and sales meetings.

On the lower deck Contura is equipped with a galley able to cater for most conference needs, including cocktail parties. Downstairs there are a public address system, an overhead projector and TV monitor and video. Contura retains the normal InterCity padded cloth seats in a 2x2 format, for small discussion groups on its lower level.

The concept of a special purpose carriage was initiated by discussions between CityRail's General Manager for InterCity services and the Blue Mountains Tourist Association. After extensive development of the idea Contura went into service in December 1990.

Market research has been undertaken constantly since then to examine customer reaction to the layout and decor, accessories and

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A FOUR-TIMES INCREASE IN CONTAINER CAPACITY AT MELBOURNE'S HUGE SOUTH DYNON TERMINAL REVEALS SOMETHING OF THE FUTURE FOR RAIL FREIGHT ACROSS AUSTRALIA. PLANS FOR MORE EFFICIENT, BETTER-MANAGED, FASTER DOOR-TO-DOOR SERVICES ARE TAKING RAIL FREIGHT INTO THE 21ST CENTURY.

The Australian Government has invested $50 million in upgrading major interstate rail lines and freight terminals as part of an operation in support of establishing a National Rail Freight Corporation. The largest single project is at V/Line's South Dynon container terminal. It is a key link in Australia's rail container service, which is to receive a $7.96 million upgrade.

The container terminal improvement project will see South Dynon's capacity increase from 100,000 containers a year to 420,000.

Federal Land Transport Minister, Bob Brown, and Victorian Transport Minister, Peter Spyker, have announced details of the $50 million package.

"It's a significant initiative in the development of rail transport in Australia and an indication of our good faith and goodwill towards the whole exercise" said Mr Brown. "The Corporation, to be

. . .The luxurious Contura car

potential users. So far the results show that on the whole Contura should prove to be a winner, with comments such as "innovative", "a higher standard of comfort" and "user friendly; they (CityRail) are taking the initiative".

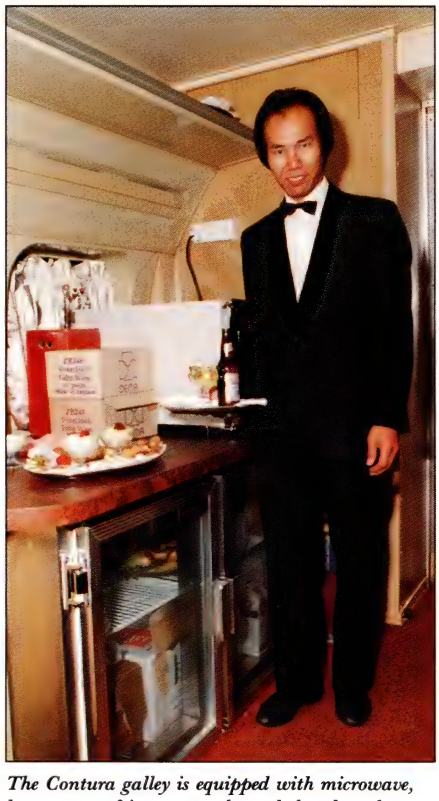
To date the car has been inspected and used by conference planners, tour operators, major venue representatives and major company groups. More work is being done to improve the carriage's presentation, with special facilities for each trip.

CityRail is in the fortunate position of having three key conference and convention centres within its service area around Sydney. These are the Blue Mountains to the west, the Illawarra to the south and the Hunter Valley to the north. All of these areas are seeing strong growth in the number of conferences being held, and the number of people attending.

With this growth, and because of the increase in venues new attractions are being sought to differentiate one from another. This is where Contura comes into its own. The car itself can be attached to any normal InterCity service, or it can even be part of its own special train. Contura is geared to the needs of the customer.

CityRail is working closely with travel groups and the convention industry to further refine the Contura concept. When the trial period is completed later this year CityRail will begin total marketing by making the car highly visible through industry meetings and special familiarisations trips. There will also be a direct mail campaign to senior executives, inbound tour operators and travel consultants.

The advent of Contura is another example of CityRail's rapid development; it is moving away from broad marketing areas into tailoring products to suit appropriate needs in the marketplace. While Contura has international aspirations, it is still in its trial period, but the signals are there that Contura will be a significant product for both CityRail and the region it serves. □



The Contura galley is equipped with microwave, hot water, refrigerator and ample bench and storage space.

the future in freight

jointly-owned by the Federal and State Governments, will handle all interstate rail freight.

"It will be a corporation in the normal sense of company operations and structures with articles and memorandums of association," Mr Brown told the gathering of customers, railway management and union officials.

"The independent board will be at arms-length from government, will have an executive administration suitably structured and will be very firmly and clearly commercially-based."

Work on continuing to increase the capacity of South Dynon container terminal will make it the biggest intermodal, rapid transit terminal in the southern hemisphere. At present from the terminal, there are two Superfreighter services between Melbourne and Adelaide each weeknight and one on Saturdays.

There are also overnight Superfreight services between Melbourne and Sydney on week nights, five services a week to Perth and six services a week between Melbourne and Brisbane.

Mr Brown said increasing the capacity of the terminal will enable rail transport to become more competitive.

Benefit to all users

These developments will benefit all users of the South Dynon container terminal with faster and more efficient movement of freight to its destination. "This multi-million dollar commitment is the result of months of planning and preparation by both the State and Federal Governments," said Victorian Transport Minister Peter Spyker.

"In fact, this funding follows a massive Victorian Government commitment of more than $12 million during the past two years towards the terminal upgrading program.

"The Public Transport Corporation has now completed stage one of the upgrade. Stage two which is well underway involves the installation of computer systems, container handling machines, trackwork and container wagons.

"This is an exciting development which will bring our rail system into the forefront of Australian freight facilities."

The funding also includes construction of a standard gauge line which will link Webb Dock with the standard gauge line to Sydney. Direct railing of containers from Webb Dock to Sydney will lead to a more efficient and faster handling of containers from the Australian National Line's terminal.

"We've finally recognised that in freight we have to operate as a nation rather than as six different States, with different railway systems," Mr Spyker said. "Everyone agrees it's ludicrous for a container to arrive in Melbourne and then be handled by three different rail authorities if it has to be transported to Brisbane.

"The National Rail Freight Corporation will overcome that problem.

"We'll operate our rail service as a nation. But we're going to have to lift our game significantly in moving freight across the country and in the dock areas so we can compete internationally with both the products we import and export."

Other work to be carried out in Victoria, as part of the $50 million package, is an extension of the crossing loops between Geelong and Ararat and a reduction of the Diapur Bank in the State's western region.

Extension of the crossing loops will enable trains of up to 1.5 kms in length to operate between Melbourne and Adelaide. This work will cost $2.55 million.

Almost $100,000 will be spent on the first stage of regrading the 1 in 50 Diapur Bank between Nhill and the South Australian border. The reduced grade will provide operational savings for locomotives on the Melbourne and Adelaide route.

In other States

$12.8 million will be spent in New South Wales. As in Victoria, several crossing loops on the Sydney to Brisbane line will be extended at a cost of $2.2 million and timber bridges, mainly between Newcastle and Grafton, will be replaced at a cost of $5.55 million.

Other projects include construction of a new $3.9 million locomotive fuelling point at Broken Hill while crossing loops on the Sydney-Broken Hill line will also be extended, costing $2.25 million.

In Sydney, the Chullora Freight Terminal will be upgraded while minor work will be carried out at Enfield.

Australia National, which operates services in South Australia, across the Nullarbor and to Alice Springs also received funding worth $10 million. This will be spent on converting rail freight wagons bogies to high-speed operation ($6.61 million), construction of a new refuelling facility at Kalgoorlie and purchase of a track maintenance vehicle.

A heavily-laden freight train snakes its way from Melbourne to Adelaide. Extended cross-over loops will allow trains 1.5 km length to operate this route.

AN also received an additional $3.5 million to conduct a study on behalf of the planned National Rail Freight Corporation (NRFC). This study will examine train control, traffic management, network communications and financial management.

In Brisbane, improvements worth $3.2 million will be carried out to the Acacia Ridge container terminal.

Federal Land Transport Minister Bob Brown said the NRFC will make it possible for rail to attract back a big share of the developing freight market. "Over the next 10 years we believe the national freight task will increase by something between 60 per cent and 100 per cent," he said. "That means whoever operates in the freight movement area will have a big slab of additional work to undertake.

"Only through the NRFC, through an efficient, co-ordinated and integrated rail system will it be possible for rail to win freight it should already be carrying. That's going to take additional investment of course.

"When the NRFC is operating the Australian Government will be examining the possibility of making further investment for us to develop something we've never had before — an integrated national rail system."

However, Mr Brown stressed the NRFC is going to have to prove itself in the market place. "Rail carries around 20 per cent of domestic freight. To obtain an increase in its tonnage it must be competitive and efficient.

"We won't be reserving any types of freight for rail. Rail must measure up! The benefits if it does will be less pressure on the enormous investment at present on all levels of government to the road system.

"The Australian Government allocates one and a half thousand million dollars a year for road construction. Then there are the questions of pollution, congestion and road trauma."

National task force

To implement the NRFC a national rail freight initiative task force was established late last year. The task force is responsible for developing in detail all proposals and recommendations on issues relevant to the formation of the NRFC.

Chairman is Mr Ted Butcher, president of the Interstate Commission between October 1987 and October, 1990.

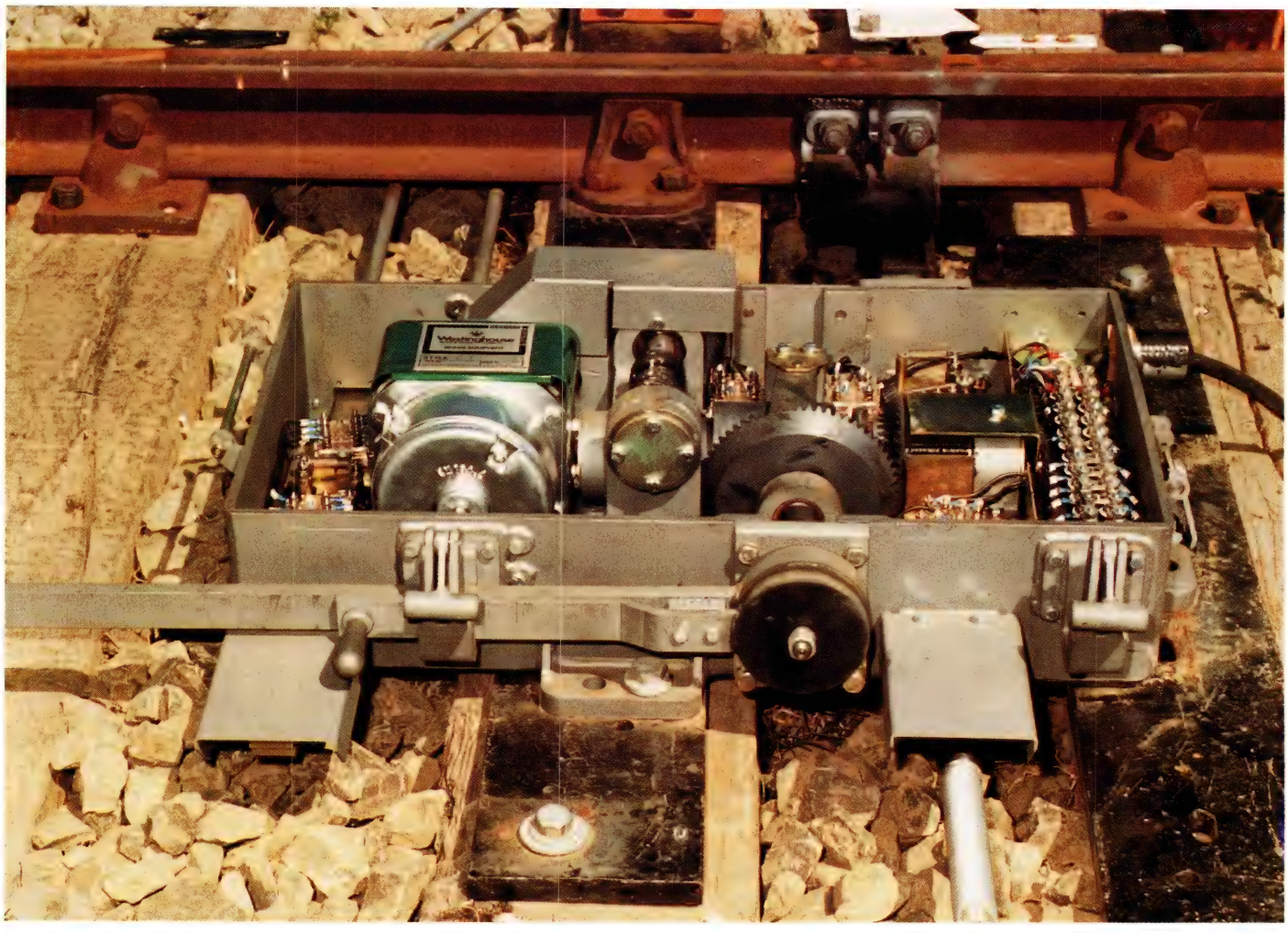
Issues being addressed by the task force include identifying and valuing assets and liabilities of the existing rail interstate freight operations which may be necessary for the operations and strategic development of the NRFC.

Other working parties are formulating policies on corporate planning; operations and industrial relations, and terminals. The corporate plan is being developed along with a business plan to achieve profitability within three years.

A proposed organisation, operating and capital structure is also being developed for the proposed corporation. □

HAWKER

SIDDELEY



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The CUBIC potential

Following its success in the transport of heavy freight throughout Australia a new series of initiatives has been adopted by rail transport aimed specifically at increasing its share of cubic freight — consumer goods, manufactured items and high-tech equipment which requires fast, secure transit.

The efficiency and reliability of rail's intercapital container services along the east coast linking Brisbane, Sydney, Melbourne and onwards to Adelaide have made strong market gains.

Rail transport's share of total east coast freight between 1988 and 1990 rose by five per cent to 38 per cent of the total volume. The short-haul east coast routes are currently not as favourable for rail compared with the routes to Western Australia where rail transport's share is a dominant 72 per cent.

It is in manufactured general freight where rail sees its most worthwhile opportunities.

This freight often consists of lightweight, volumetric or cubic items. Manufacturing industry tends to input dense raw materials such as timber or logs, steel ingots or sheet, oil, and grain which it converts to so-called fluffy products like furniture, cars, plastic goods, and breakfast cereals.

In fact, rail transport's share of this general freight area has risen in recent times from 24 per cent to 30 per cent according to statistics compiled by the National Freight Group. Realisation of the potential for rail has influenced the decision to move into the cubic freight market.

"As rail gains additional market, the type of freight changes," says Malcolm Cameron, National Freight Co-ordinator. "It moves from dense, low value raw materials to consumer, manufactured, hi-tech products requiring fast secure transits. To carry these economically required a number of changes now in place, plus a long-term goal for the corridors."

Changes he refers to include:

- ☐ Containers can now be 9'6" (2.89m) high compared with 9' (2.74m) high previously. This was achieved by lifting height restrictions on all corridors made possible in most cases by removing ballast and lowering the rails.
- ☐ Freight rates have been restructured to provide a minimum of 8 tonnes per 6.1m container (instead of 11 tonnes), and 16 tonnes for a 12.2m container (instead of 18 tonnes).
- ☐ Rail transits and reliability have shown that rail can deliver to "just-in-time" inventory schedules in manufacturing.

These initiatives, in fact, are moving with the market.

Freight is becoming more cubic each day. Modern light materials like plastics and aluminium are replacing heavier materials through improved product design. There is a trend to move consumer products and imports around the country, and a trend towards national distribution even for fast foods, cakes and other perishable items. Hopefully high tech industry is replacing imports.

All these factors push the total market to higher cubic freight requiring low-cost, reliable transport.

"These trends fit well into studies by the National Freight Initiative," says Malcolm Cameron. "The NFI is looking at a range of possibilities. One is the double stacking of containers from Melbourne to Sydney and on other routes. Removal of many speed and reliability restrictions is another.

"Rail transport is widening its customer base in the process.

"In current circumstances any company would be well advised to place a proportion of freight on rail," concluded Malcolm Cameron. "Our marketing efforts must capitalise on this situation with a performance to match." □

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Peach 4945

Rates fall for major export industries

The cost of rail freight for the grain and coal industries in New South Wales will be two per cent lower this year in real terms bringing to 30 per cent the overall drop in rates for these industries during the past five years.

Freight Rail, a division of the State Rail Authority (SRA) last financial year was able to improve its labour productivity by 28 per cent, and other cost-saving reforms are envisaged in future.

The overall SRA fuel bill is expected to rise by about $12 million this year due to The Gulf crisis; nevertheless it has undertaken to continue to reduce real freight rates during the remaining two years of its contracts with both the Australian Wheat Board and the NSW coal industry.

These major industries contribute more than 75 per cent of the total freight carried by State Rail.

Its business group, Freight Rail, in 1989 embarked on a vigorous five-year plan to build on the firm foundations of an investment program. Driving the reform process is the desire for Freight Rail to be a commercial, self funded bulk haulier which is attuned to the marketplace and its customers.

As well as a more efficiently-managed organisation, Freight Rail is continuing to invest in new locomotives, new wagons and better information systems.

By mid-1994 it plans to have doubled the freight hauled per employee, improved wagon utilisation by 40 per cent, reduced staff numbers by 42 per cent, and reported its first operating profit.

As an indication of its progress in the year to mid-1990 Freight Rail had:

- ☐ Increased labour productivity by 26 per cent (the equivalent of an extra 200,000 tonne kilometre per employee)
- ☐ Improved wagon utilisation by 10 per cent (representing 150,000 tonne kilometre extra per wagon)
- ☐ Increased tonnage hauled by seven per cent (to 53.7 million tonnes)
- ☐ Reduced coal and wheat freight rates in real terms by up to two per cent
- ☐ Increased group revenue by 16 per cent
- ☐ Reduced staff numbers by 16 per cent (2855 employees).

A decisive decade

The 1980s was a decisive decade for bulk haul rail freight. During these years bold investment decisions were taken which prepared State Rail for the heightened competitiveness and constraints of the 1990s.

During the 80s State Rail invested more than $1 billion dollars in locomotives, wagons, terminals, track infrastructure and signalling to ensure haulage capacity would more than meet the demands of industry.

In 1989 it began its most critical period of reform.

It has now developed a globally competitive bulk rail freight network. Its increased train size and haulage capacity has matched the transportation needs of resource producers, and delivery performance efficiency to export terminals has assisted in the development of the coal and wheat export industries.

There is no doubt that its competitive rail freight rates have underwritten NSW export growth.

A volatile environment

Bulk haul freight operates in a volatile commercial environment. The marketplace is totally deregulated — but rail retains a strong competitive advantage over road.

There is an expectation that Freight Rail will attain profitability by 1994 — through increased haulage, improved productivity, better customer service and flexible pricing policies. Since July 1990 Freight Rail has funded its own investment or borrowed commercially.

Coal and wheat traditionally are two of Australia's great export industries. Freight Rail, therefore, has more than a passing interest in their success. While the size of Australia's wheat cheque is determined by the world market, rail costs are

influenced by domestic changes in costs such as wages and fuel.

Freight Rail's increased haulage efficiency has been achieved through productivity enhancement and major investments including:

- ☐ New rail facilities at the Port Kembla Grain Terminal ($16m)
- ☐ An improved Moss Vale-Unanderra rail link servicing the Port Kembla Grain Loader ($36m)
- ☐ Plans for a 54 per cent increase in train size from 39 to 60 wagons.

While these steps confirm a commitment to the wheat export industry, there's a long way to go before Freight Rail makes money out of wheat.

Freight Rail plans to increase its market share of coal haulage by 1995. This will be achieved through increased levels of exports and winning new business from road. Volume incentives and performance rebates will continue to assist the Australian coal industry.

In improving the efficiency of its bulk haulage operations Freight Rail is reducing heavy road traffic.

Export coal transported by Freight Rail in 1989/90 was equivalent to 1.4 million laden semi-trailers. To transport by road the 6,300 tonnes of coal carried by a single 84 wagon train would require 250 loaded semi-trailers and thousands of litres of extra fuel.

Freight Rail, by winning new business from road, is both continuing to improve road safety and providing more energy efficient transportation.

Down also in Victoria

A scale of freight rates which the Victorian Government says represents a 50 per cent real reduction during the past five years, has been negotiated between the Victorian Public Transport Corporation and the Australian Wheat Board.

The average base rate will remain about the same as last year, but under a new co-operative arrangement will be linked to movements in the price of fuel and a performance incentive scheme.

The agreement is for three years with rates for 1992 and 1993 to be determined through a joint AWB/PTC productivity review process. □

A grain train heads towards the seaboard terminal at Geelong, Victoria. Far behind is Ballarat and the broad farmlands of the interior.

Wooden sleepers give way to concrete

Australian National's 20-year concrete resleepering program is in the final leg of a long haul — on target and set for completion by 1994.

A large slice of credit during the past few years goes to a team of hardy men and a lumbering metal monster that wanders AN's Outback rail system replacing aged wooden sleepers. It is the SMD80-AN concrete resleepering machine.

The concrete resleepering program for all standard gauge main line track north of Adelaide saw the insertion of the four millionth concrete sleeper in late 1989.

Before the SMD80-AN came on the scene, a large proportion of those sleepers was inserted through the muscle and sweat of rail gangs of up to 60 men.

The Central Australia Railway (CAR) has been completely resleepered and the Trans Australia Railway (TAR) nearly completed.

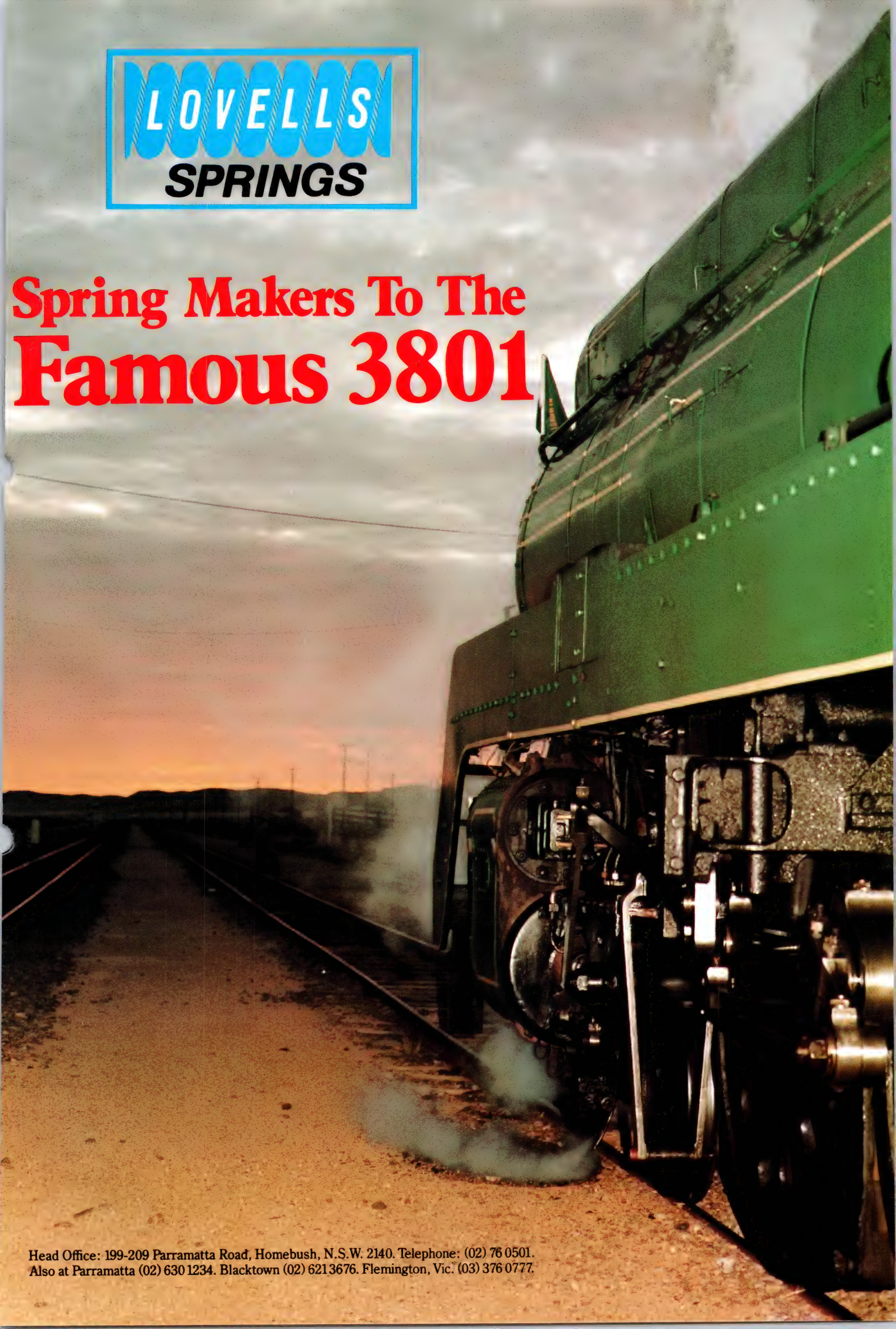
Some 800,000 concrete sleepers remain to be inserted over the next three years.

The SMD80-AN, purchased two and a half years ago for $2.3million, inserted 206,432 concrete sleepers in the Trans Australia Railway in 1989/90. That effort increased to 79 per cent the percentage of concrete sleepered track between Broken Hill in New South Wales and Kalgoorlie in Western Australia.

The machine inserted its 500,000th sleeper in September 1990, during work between Broken Hill and Cockburn on the Broken Hill line and is relaying up to 1.5km of track a day. In the last week of work on the Broken Hill-Cockburn section the SMD80-AN and its 40-man crew inserted on average 2,076 concrete sleepers per day.

Record for one day

During work on the TAR early last year 4,262 concrete sleepers were inserted in a single day



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Those sort of figures put a smile on the face of AN Technical Services general manager Andrew Neal.

"We are now achieving production levels significantly higher than we ever anticipated," he said. "The figures are far in excess of what most rail systems have ever achieved in concrete resleepering.

"The world record for a concrete resleepering machine is 7,000 sleepers inserted in a single day on Burlington Northern in the United States. That effort was made specifically to establish a record.

"At this rate, the plan to completely resleeper all standard gauge lines north of Adelaide, with the exception of the Port Augusta-Leigh Creek coal train line, will be completed on schedule."

The ongoing battle to beat the clock would have been lost long ago but for the efforts of the resourceful AN crew which keeps the metal monster on the move, Mr Neal said. "There is a strong team spirit amongst the SMD80-AN crew. It has done a great job," he said.

Strong team spirit

Roadmaster Dick Dickinson is in charge of a tremendous gang of people engaged in AN's resleepering program and they work very well together.

"We are proud of them. It has got to be the best resleepering gang in Australia, if not the world," Andrew Neal says. "A lot of credit also must go to the manager plant and works Angelo Demertzis and his team for their efforts in maintaining the SMD80-AN at peak operational level. Whenever a significant failure has occurred, they have managed to get the show back on the road as quickly as possible.

"In fact, after the last repair of the main gearbox, the machine ran better than ever."

Operation under difficult conditions is not foreign to the SMD80-AN crew. It started four weeks behind schedule last year because of a couple of significant breakdowns on the SMD80-AN. The main drive motor broke down late in 1989.

"We finished 1989 operations with one day to spare, hauling the SMD80-AN back and forth to the work site with a locomotive so the project could be completed. Then, early in 1990 we discovered the main bearings in the hydraulic gearbox were disintegrating. New bearings had to be manufactured and flown in from Austria — that delayed us by another two weeks," said Andrew Neal.

Since then the crew has been achieving high production rates, despite the fact sleeper removal has been hindered because the old wooden sleepers often splinter and break.

The ultimate benefits of the concrete resleepering program to AN are obvious. Concrete sleepers have a life span of up to 50 years, require far less maintenance and offer greater rail support.

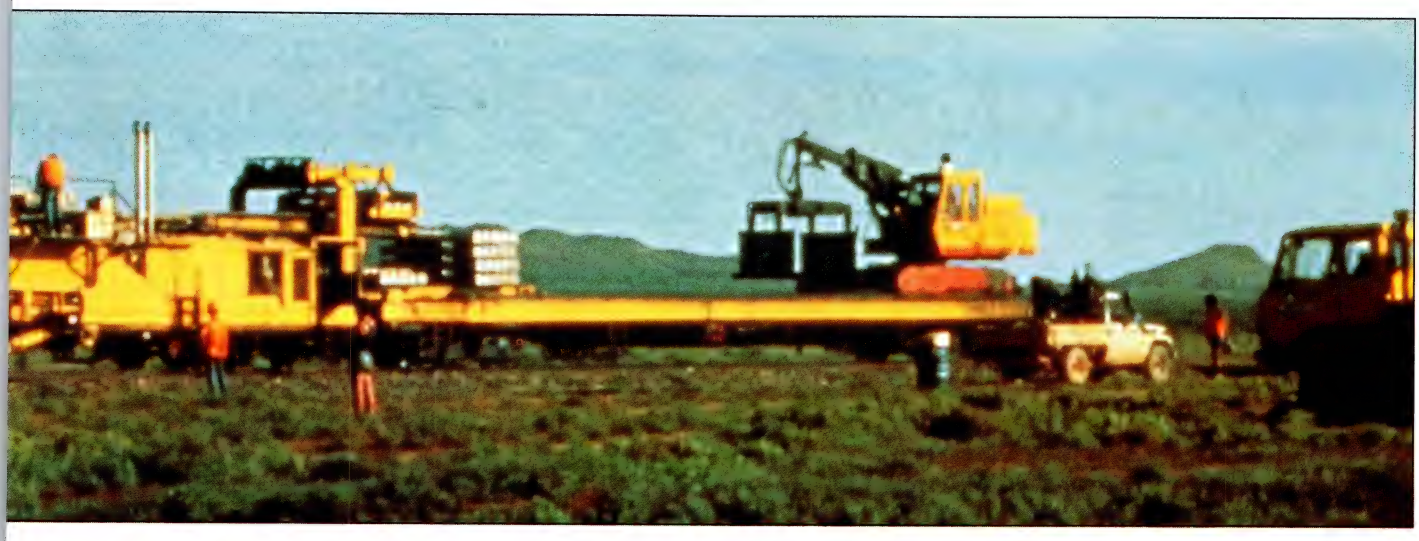
They offer greater resistance against buckling. AN has been using concrete sleepers for 20 years and has not experienced one incident of train derailment through buckled track on any resleepered section.

"The upgraded track makes us much more competitive, it significantly reduces maintenance effort and cost and cuts service interruptions. Fewer speed restrictions due to bad track mean greater reliability of service to customers," said Andrew.

Gauge-convertible sleepers

AN's concrete resleepering program received a boost recently with announcement of a $21 million Australian Government grant to begin gauge-convertible concrete resleepering of the broad gauge Adelaide to Melbourne line. Work begins in April this year to upgrade a 133km section of the South Line between Coonalpyn and the Victorian border.

AN will replace ageing wooden sleepers with 200,000 gauge-convertible concrete sleepers in this



section of the track during the next three years.

The SMD80-AN work camp moved to Watson on the TAR in October to resleeper the section of track between Ooldea and Fisher, the beginning of 472km of straight track across the Nullarbor — the longest stretch of straight track in the world.

The team currently is working on the Broken Hill line north of Peterborough, between Hillgrange and Paratoo.

The ultimate goal — to insert around 800,000 concrete sleepers on the Broken Hill line from Paratoo through Port Pirie and down to Salisbury and in the final section of the TAR between Ooldea and Deacon — by 1994.□

IN THE HOT, DRY INTERIOR OF AUSTRALIA THIS MACHINE AND ITS 40-MAN CREW ARE INSERTING CONCRETE SLEEPERS AT AN AVERAGE OF 2,076 A DAY REPLACING THE OLD, WORN WOODEN SLEEPERS. THERE ARE JUST 800,000 MORE TO GO.

Study of sleeper performance aims to cut costs

The University of Wollongong and State Rail in New South Wales are co-operating in a valuable study into sleeper replacement.

The study will evaluate experimentally and theoretically the performance of different sleepers in the same track.

The University's Deputy Vice Chancellor, Professor G. R. Sutton, said State Rail had taken the leadership in the trials by building trial test sections at Taree.

"A dramatic reduction in durable timber of suitable log size for sleepers has led to a search for other materials for replacement in many countries," he said.

"Typically, at large capital cost, the whole track would be made of new sleepers.

"Alternatively, at lower capital cost, only some sleepers are replaced. The study is looking at such a track, made from a mix of different sleepers," Professor Sutton said.

"The properties of the basic three materials (timber, cement and steel) are vastly different, so improved analysis is essential to evaluate the track performance," he added.

The studies are being carried out by Mr Richard Kohoutek of Wollongong University, with the co-operation of northern region offices at Newcastle and Taree.

Tests have also been carried out at Wollongong, and more are planned.

The study could result in a considerable reduction of capital costs, while improving track performance.□

A new life for wood

Thousands of British Rail's 13 million wooden track sleepers are expected to be given a new lease of life with a portable computerised system that can detect and stop wood rot without removing them.

With the average cost of replacing a life-expired sleeper currently running at about $126 a time, British Rail says its new detection system offers the prospect of huge savings in track maintenance costs. It already has eight of the integrity testers in use and another 13 are being sought at a cost of $428,400.

Mr Keith Tolley, BR permanent way maintenance engineer based at Paddington station in London, explained: "Initial tests centred around the need to prevent rot in the heartwood of sleepers. Wooden sleepers are creosoted but the creosote does not penetrate the heartwood at the centre of the sleeper.

"Water seeps into the heartwood through cracks, fungus grows and decay starts. But track inspection in the traditional way, visually and by kicking a sleeper or hitting it with a hammer to check its resonance, does not give an accurate analysis of its condition.

"Often the top of the sleeper looks fine but the inside is rotten or else the top looks poor but the inside is sound. This means many sleepers are removed or replaced merely because we have not got an accurate system of determining their condition. It is all a bit hit or miss."

But the integrity tester is set to change all that.

It uses a probe to carry out the high-tech equivalent of tapping a piece of wood to see if it sounds hollow. The probe is connected to a specially designed portable computer which enables the condition of the sleeper to be evaluated on a scale of one to six. This indicates whether it is sound, would benefit from preservative treatment or should be replaced.

Sleepers found to be suitable for preservation treatment then have a tiny 75mm-long rod of wood preservative chemical inserted in them. This initial treatment lasts for six years and by inserting new rods periodically the life of a timber sleeper can be extended to 25 years or more.

An operator can test up to 200 sleepers an hour and then store data on up to 10,000 sleepers before transferring it from his portable computer disc that can be used by civil engineers to judge the condition of sections of track. Sleeper replacement normally costs around $95,760 per mile (1.6km) but it is thought preservation treatment could cut this to $80,640 a mile.

BR says operational trials with the integrity tester have been carried out in all regions of the country and the system has attracted worldwide interest. It may now also be used to check on rail bridge and crossing timbers. □

Air temperature is right on track

Reading the air temperature right next to railway tracks in Australia's remote areas is an important part of train control assessment in ensuring an efficient service. Decisions on track speeds can be made more accurately.

In the past, local shire secretaries, postal officers, pool attendants and other people have provided this vital temperature information, but with varying degrees of reliability.

Now, Westrail has developed a computerised remote ambient temperature network which enables engineers to accurately read air temperatures next to railway lines at remote locations.

Assistant division engineer at Northam, Peter Racside, who helped develop the system says: "It gives us greater accuracy in determining track conditions, particularly in the hot weather.

"Heat speed restrictions are imposed when temperatures reach 35, 40 and 45 degrees Celsius.

"In the past heat-related speed restrictions generally have been applied with a wide safety margin; thereby possibly restricting train speed when it has not been necessary to do so."

The new system features remote field weather stations linked to the PABX communications line to an office computer.

Each weather station is made up of an air temperature probe that can read temperatures between 0 and 60 degrees Celsius, a 32K data logger and a modem.

A similar modem is based at the District Office Computer to access the weather stations located within the district or division.

Peter said the system allowed instant reading of the current temperature so decisions on track speed can be made more accurately.

"The two weather stations installed last year proved very reliable," Peter said.

"Plans are under way to extend the system to other divisions and districts and to modify the software to include reading of rail temperatures.

"The use of the network will potentially save derailments which occur because of the high temperatures and produce cost savings in crew time by not applying heat speed restrictions unnecessarily." □

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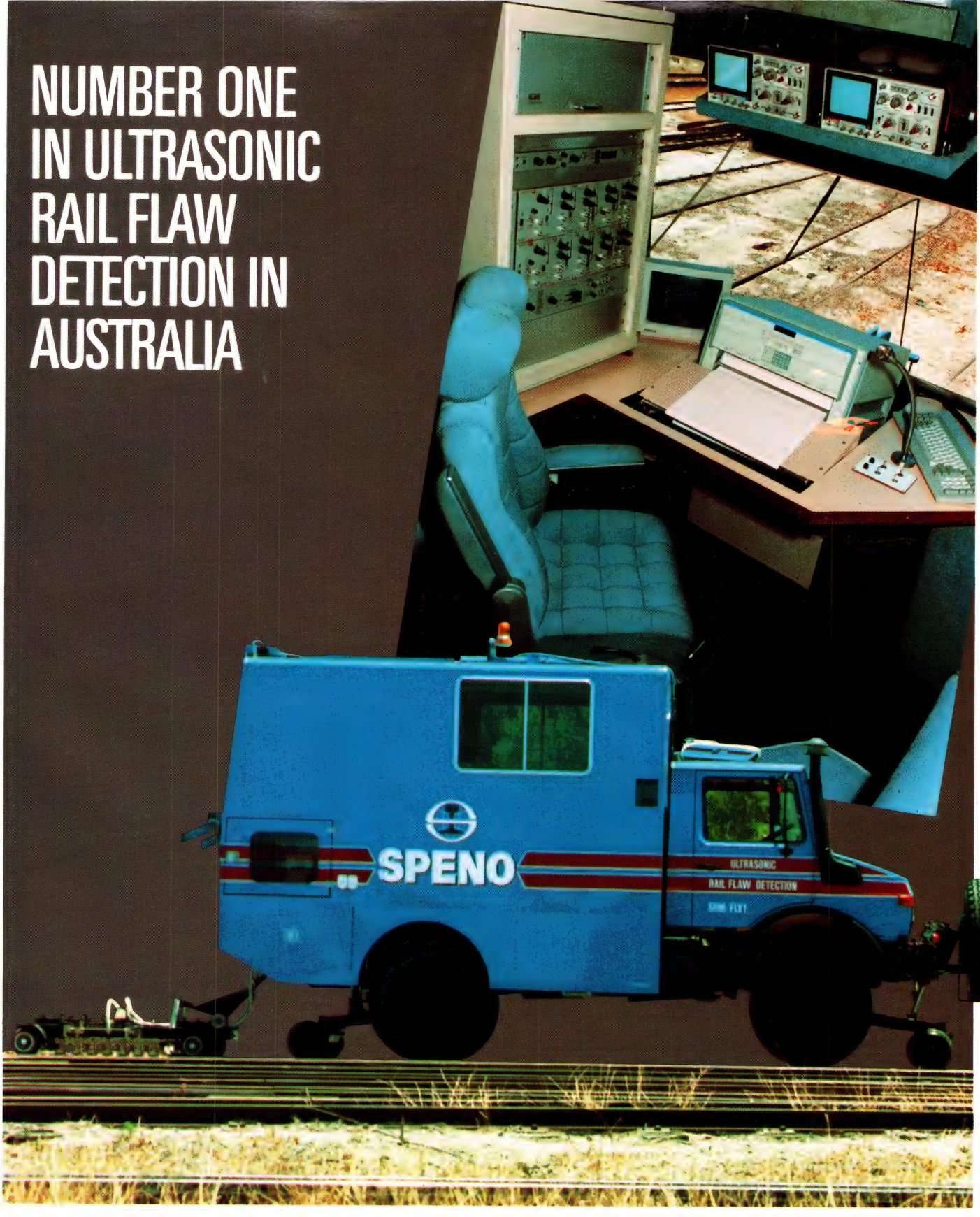

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On the for the

THE TREMENDOUS ADVANTAGES OF SPEED IN PASSENGER TRAVEL ARE EXEMPLIFIED BY THE RAPID GROWTH OF AIRLINE SERVICES WHICH HAVE BEEN CAREFUL TO MAINTAIN A HIGH STANDARD OF PASSENGER SERVICE ON THE GROUND AS WELL AS IN THE AIR.
BUT TODAY, IT IS TAKING JUST AS LONG TO GET TO AND FROM AIRPORTS AS THE AIR JOURNEY BETWEEN CENTRES OF LARGE POPULATION.
THERE ARE OPPORTUNITIES, THEREFORE, FOR FAST DIRECT AIRPORT-CITY RAIL LINKS SUCH AS THAT PLANNED FOR SYDNEY BY 1993 AND AS

JACK DUCHEMIN

POINTS OUT IN THIS ARTICLE, REASONS WHY VERY FAST TRAINS CAN BE COMMERCIALLY SUCCESSFUL AND OFFER KEEN COMPETITION AGAINST PRIVATE CARS AND AIR TRAVEL.
MR DUCHEMIN SPENT THREE YEARS AT THE RESEARCH AND TEST CENTRE OPERATED BY THE INTERNATIONAL UNION OF RAILROADS IN UTRECHT SPECIFICALLY INVOLVED WITH VERY HIGH SPEED GROUND TRANSPORTATION TECHNOLOGIES.
CURRENTLY HE IS A TRANSPORTATION EXPERT IN THE COMMISSION OF THE EUROPEAN COMMUNITIES, BRUSSELS.

A Very Fast Train (VFT) passenger service between Sydney and Melbourne is an idea which has captured public imagination. Train travel at speeds of 350 km/h involves totally new concepts for rail travel, new infrastructure dedicated to speed, and a dramatic change in train operations.

The suggestion that high-speed trains might compete with car and airline services is not as remote as it might seem.

European experiences show that very high speed is the only way for rail to increase its passenger traffic, to improve its market share and at the same time to make profits.

Innovative rolling stock with tilt body systems never remove the need for new infrastructure. If tilting truly improves performance on existing lines, it does not permit speeds allowing rail to really compete with road or air.

fast track 21st century

Express Passenger Trains (XPT), like this country service in New South Wales, may soon be running a shuttle service between the City of Sydney and its major airport.

The considerable kinetic energy involved with high speed allows a new approach to the acceptability of track gradients. Usually, every possible effort is made by railways to avoid gradients of more than one per cent. Thanks to kinetic energy, high speeds permit gradients of up to five per cent, and this can reduce investment dramatically. Otherwise, construction costs per km are three or four times greater due to the large percentage of the route which has to be taken through tunnels and across bridges.

Dedicated lines are strongly recomended for high speed rail passenger services.

Sometimes mixed traffic on new infrastructure is inevitable, as for example in the Channel Tunnel.

The presence of fast passenger trains and slower freight trains on the same line, however, can hinder traffic flow.

Elimination of freight trains simplifies greater problems connected with safety and limits the cost of track maintenance which is directly linked to axle loading. That is why the French National Railroads, after nine years of experience, claim that their TGV high speed lines are less expensive to maintain than traditional mixed freight and passenger lines.

When deciding on a high speed corridor, goverments and administrations must think about their future rail network. The compatibility of the high speed network with the existing railway lines is a significant advantage of the wheel/rail system. Rail compatibility allows very high speed trains to operate on the traditional network at lower speed. This enables passengers to benefit from an efficient land surface transport system and to travel directly to or from the station located on lines connected to the high speed infrastructure without the need for transfers.

Fast airport link

Sydney plans to have a fast train link to its airport by 1993.

This concept of connecting international airports with the grid of the high speed rail network has been developed by many European countries.

It is very profitable for railway companies to take advantage of the air passenger traffic in enhancing airport accessibility by high speed trains. On the other hand, it is also largely beneficial for airports. In fact, in the future there will be two types of airports in Europe:

State Rail (NSW) new livery for Countrylink services including the new high-speed Explorer trains which will be supplied by ASEA Brown Boveri Australia and will provide comfort and service on northern tourist routes.

'Thanks to kinetic energy, high speeds permit gradients of up to five per cent, and this can reduce investment dramatically.'

- ☐ Those connected to the high speed rail network which will see a continous increase in their traffic;
- ☐ The other whose traffic will be diverted in favour of the former.

Shuttle trains like the proposed Sydney-airport direct service, specially adapted to air travellers, may be put in service to city centres following the successful example of Lufthansa Airport Express in Germany. Existing suburban services do not fit the needs of air passengers and are used mainly by commuters working in the airport area.

A high speed train is generally formed by two power engines enclosing a set of around 10 trailers (possibly double decked) which represents a capacity of from 300 to 500 seats, close to that of a wide body aircraft. Two trainsets may be coupled offering seating for as many as 1000 passengers.

Coupling or decoupling trainsets is very easy and could be done in a very short time allowing adjustments to capacity according to the traffic or, after a high speed journey, re-routing to a different final destination.

Like air and road, rail must offer direct and frequent services between two large cities, or two densely populated areas, without any intermediate stops. Many stops may be provided at final destinations, but the very high speed journey must go direct using the high speed network, by-pass around towns and finally traditional lines. This concept is progessively spreading in all companies operating high speed lines. It was first put into practice successfully by the French National Railways. Today fully booked TGV trainsets are going from Lille in the north of France to Lyon without any stops in Paris, in the same way direct TGV's are linking Paris and Marseille without stopping in Lyon.

When travelling from London to Amsterdam, why for example stop in Brussels?

Terminal upgrading

The modern traveller is now a regular user of all modes of transport, particularly his comfortable private car and the speedy aircraft. More than 80

Experience the legendary Dreamtime on The Ghan

When you travel the outback on this famous desert train, The Ghan, you go back in time to the atmosphere of Australia's legendary Dreamtime. ✦ You also go back to the golden age of elegance in train travel. ✦ The Dreamtime Lounge is part of a grand refurbishment of one of the world's great trains—The Legendary Ghan. ✦ The colour palette takes its inspiration from the rich ochres of Ayers Rock, sand reds and green of spinifex grass. ✦ Hand painted fabrics capture a stylized impression of Dreamtime art forms, landscapes and reptile wildlife. ✦ The Dreamtime Lounge serves a range of drinks from a fully stocked bar made of polished Australian red granite while you relax in roomy alcove seats featuring motif imprints or in moveable plush chairs. ✦ A non-smoking area, the Dreamtime Lounge offers 24 hour coffee and tea facilities as well as TV and video viewing. Experience the legendary interior on The Ghan soon.

Winner of the 1990 Australian Tourism Award For Tourist Transportation.

PRO&M ANN1541

THE GHAN

TRACKS

THE XPT IS OPENING UP COUNTRY NEW SOUTH WALES AS IT SPEEDS ITS WAY THROUGH THE CENTRAL WEST TO DUBBO. OTHER SERVICES LINK SYDNEY WITH TAMWORTH, ALBURY, MURWILLUMBAH AND BRISBANE. $120 MILLION IS THE OVERALL COST OF MODERNISATION TO PROVIDE WORLD–CLASS COUNTRY TRAIN SERVICES.

per cent of people in the United States of America have flown at least once. In Europe, all high speed rail clients are or will be airline customers. But if airports are fully adapted to modern travellers, railway station are still conceived, built or renovated with nineteeth century ideas.

Airports, which have benefited from the beginning from the glamour of aviation, have since acquired their own prestige. They offer a lot of essential qualities compared with railway stations: first cleanliness and security, then services, friendly reception, comfort, baggage handling, cosy waiting rooms and easy boarding.

Airports have also managed to keep and improve these qualities when air transport became a means of mass transport, with for example more than 50 million passenger per year using Chicago O'Hare air terminals.

Union Station in Washington D.C. is no longer a railway station but rather a true Rail Terminal. For the first time, all needs of modern passengers are fullfilled in a railway station whose rehabilitation has been achieved without altering the beautiful architecture of the building.

Open multi-purporse counters welcome passengers allowing queues based on "the first come, first served" philosophy. Baggage registration for intercity trains allow travellers to fully enjoy the commercial, business and leisure centres inside the building.

Colour TV screens everywhere display "Arrivals" and "Departures" with flashing lights for "just arrived" or "boarding" trains. The atmosphere is quiet, friendly, air-conditioned and no longer dominated by inaudible announcements.

Discreet but clearly visible policemen enforce the necessary security. The intercity passenger proceeds to his gate on spotless marble among house plants and fountains. Waiting rooms for passengers only are provided with some facilities: newspapers, drinks and telephones.

Free access to platforms is not allowed; checking is compulsory, so that conductors on board can be at the service of the clients, rather than be occupied with stowaways or trouble-makers.

High speed rail needs modern terminals of the same quality as airports, possibly with private and independent management.

Friendly to the environment

High speed rail is economic in using land.

- ☐ A double track capable of carrying a maximum 20,000 passengers per hour in each direction (two coupled trainsets every 3 minutes) is only 15 metres wide compared with at least 60 metres for a six-lane highway allowing theoretically the same traffic (2000 cars per hour per lane; 4 passengers per car).
- ☐ Total land surface for a 300 km long high-speed line is at most 450 hectares, much less than an international airport like Chicago O'Hare, London Heathrow or Frankfurt.

Electrical energy used for propelling high speed trains produces no pollution along the lines and in railway stations. Moreover electricity could be provided by non-pollutant sources such as hydroelectric power plants.

Where energy is concerned, high speed trains

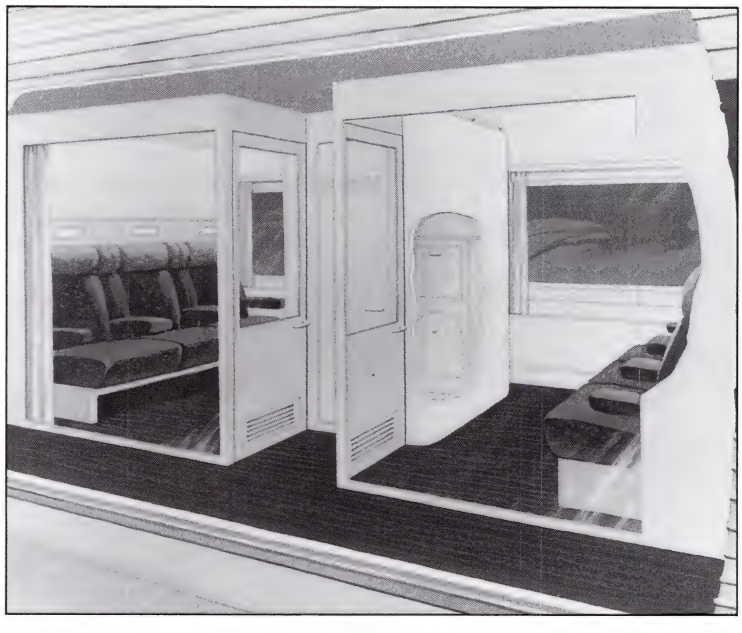
are extraordinarily efficient since at 300km/h the most recent rolling stock can achieve a per unit consumption expressed in oil-equivalent units of one litre per 100 km per seat available. That is two times less than a private car at a much lower speed and three times lower than up to date aircraft such as an Airbus 310 or a Boeing 767.

Contrary to common sense, high speed does not mean heavy noise. Suburban trains are often much noisier. Technical improvements have made possible tolerable levels of noise and new progress is expected in the years to come. Nevertheless special noise protection could be provided in sensitive areas, but demands to bury high speed lines will only make costs soar, and delay projects.

Lastly, as regards travel safety, the likelihood of accidents is a thousand times greater for private car users than for train customers.

Very high speed rail built and operated according to the preceding philosophy is a totally new, fast, reliable, safe, very efficient, highly competitive, evergy saving, environmentally friendly system of transportation. High speed rail is becoming the most economical, profitable and sophisticated high speed surface transport system in the world.

It must be finally stated that the size of the highway network in Belgium and the Netherlands, with a very high density of 352 inhabitants per sq.km demonstrates that use of land for the construction of very high speed rail lines is always feasible even in the most heavily populated areas.



Sleeping berth accommodation aboard the XPT, here rigged for daytime use, includes shower and toilet facilities with spacious surroundings and picture windows.

The fast across

TRAIN AND LUXURY COACHES TO TAKE VICTORIAN PASSENGERS ONWARDS ACROSS THE STATE AND BEYOND LIKE THOSE (LOWER RIGHT) EMBARKING AT ALBURY FOR MURRAY RIVER TOWNS.

It was all-aboard at Albury the Murray River city just across the Victorian State border, as passengers boarded the luxury high-deck coach which would speed them across northern and western Victoria to Adelaide, the south Australian capital. The 45 passengers were about to embark on V/Line's Speedlink service.

The Albury-Adelaide link pioneered today's extensive network of Link services which have grown dramatically during the past five years.

When introduced in 1984, Speedlink reflected a new way of thinking. Rather than just running trains, V/Line shifted its emphasis to "total service," a concept aiming for a fully integrated public transport system across country Victoria.

The plan was to extend the number of destinations which could be reached on the existing rail network, by using co-ordinated road coaches to take passengers beyond regional centres where the trains terminated.

Today, with V/Line as the country arm of Victoria's Public Transport Corporation, that thinking continues as the Link services are being continually refined to meet market demands.

Architect of the concept, Passenger Service Division's Group Manager Business Development, Geoff Smithwick, says: "Rail can only go so far.

"It's just not economically feasible to operate passenger trains beyond the major regional population centres. However there is a market that wants to go past where the rail lines end, and our Link services efficiently cater for this."

The coaches which run these services are privately operated, but are marketed under the V/Line banner and are painted in the V/Line livery. This helps foster the idea of a fully co-ordinated network and customers perceive the Link concept as an overall extension of the rail lines.

"Passengers generally don't mind one change of mode during a journey, as long as it's done quickly and efficiently," said Geoff. "The key to Link services is close co-ordination whereby the road coaches are waiting at the station when the trains arrive."

With this in mind, Geoff and the private bus operators have formed a very successful partnership with the blessing of the State Government, which has been keen to see an integrated and "user friendly" means of travelling throughout Victoria.

Highest standards of service

In establishing Link services care has been taken to ensure that the highest standards of service are provided. Coaches must be five star level with air-conditioning, reclining seats, toilets, drinking water and the best quality seat and floor coverings. Videos are also provided on many runs. Only on lesser patronised routes are four star, two-axled coaches allowed.

As the name implies, Link services aim to provide a link with the passenger trains, but often they are much more than just a coach to those towns beyond the railhead.

Sometimes service voids are filled by operating Link services so that they fill in the gaps left between the rail lines as they fan out from Melbourne. Previously towns on one rail corridor had no service across to others on, or on the way to, another corridor. Much research was carried out to find out where voids existed and how they could best be provided for.

In doing so a likely market was identified between Adelaide and Sydney for a faster service than the

passenger link Victoria

28-hour rail journey on the *Indian-Pacific*, or alternatively, a 24-hour coach trip.

What resulted was an integrated road service connecting with the XPT from Sydney at Albury, and running via Wangaratta, Shepparton, Swan Hill, Ouyen, Pinnaroo and Murray Bridge through to Adelaide.

Called Speedlink, this overnight 21-hour service is operated by Holidaymakers, a well-known Mildura and Adelaide-based tour company.

Since its introduction in 1984, Speedlink's popularity has increased to such an extent that the original 45-seat coach was replaced two years ago by a 57-seat double-deck coach, which has just recently been replaced by a new high-deck vehicle. Unlike the double-deck coach, the high-deck coach seats all passengers on the upper deck, and provides increased luggage space and toilet areas on the lower deck.

Not only has Speedlink opened up a new market between Sydney and Adelaide, it has also provided a fast service between Adelaide and major centres in north and north-eastern Victoria.

FIVE-STAR COACHES WITH AI CONDITIONING, RECLINING SEATS, TOILETS, DRINKING WATER, AND THE BEST QUALITY SEAT AND FLOOR COVERINGS ARE THERE WAITING AT THE STATION WHEN THE TRAINS ARRIVE. ONE-STOP BOOKING AND TICKETING COVERS BOTH ROAD AND RAIL. JUST HOW EXTENSIVE IS VICTORIA'S TRAIN-BUS LINK SERVICE IS SHOWN ON THE MAP.

Another link service

Following the success of Speedlink, another link service, Daylink, began in December 1985. Designed to complement *The Overland* overnight train service between Melbourne and Adelaide, Daylink is operated by V/Line InterCity passenger train between Melbourne and Dimboola, and road coach for the remainder of the journey.

Again, because of increasing patronage a double-decker coach is used for a five-hour run.

The figures speak for themselves. In the first year of operation 8,000 passengers travelled, while last year this figure had risen to more than 24,000.

Commenting on Link services, Geoff Smithwick said: "We are very receptive to any ideas the coach operators put to us. If we see merit in the suggestion, and can also see some financial return to V/Line, we're happy to handle the marketing and promotion.

"Both Speedlink and Daylink make money for V/Line, and very importantly, more people end up on our trains," Geoff said.

During the past five years the list of Link services has grown to include places such as Mildura, Broken Hill, Merimbula, Canberra, the Barossa and Murray Valleys. All of these famous Australian tourist destinations are now linked to the V/Line passenger network.

Geoff says this is all part of the plan.

"We are not just operators of rail and road transport; we are in the travel business," he said. "The public now has a high estimation of V/Line's operations and what it can offer in interstate and intrastate travel. They know we'll provide the service with the most appropriate type of vehicle.

"Now that we have got something to offer we're telling people about our services, and our changed attitude to their needs."

Every publicity medium is used by V/Line in its advertising — metropolitan and rural radio and press, posters, TV — anywhere a message can be highlighted.

Where Link services are concerned, the private bus operators who operate the service either in conjunction with, or under contract to V/Line, benefit from this advertising as it is on a wider scale than individual companies would usually be able to manage.

How the public benefits

The public benefits through a fully co-ordinated network because they get cheaper fares, better vehicles and a wider number of destinations, along

with one-stop booking and ticketing.

In several cases the introduction of Link services has stopped duplication of services along a particular corridor.

A good example of this was between Melbourne and Bairnsdale where V/Line passenger trains and Dyson's coaches, operating an interstate service between Melbourne and Bega, ran parallel to each other.

Last year V/Line and Dyson's got together and decided to truncate the Melbourne end of the coach route at the rail terminal (Bairnsdale) and provide a better co-ordinated service from there. This move enabled Dyson's to extend the Bega run onto Narooma, which is now known as the Sapphire Coast Link, and to begin operating a new service, Capital Link, to Canberra via Bombala and Cooma.

A similar unification happened at Warrnambool, where South Western Roadways operated to Portland, as well as a cross-border run to Mt Gambier. This paralleled the V/Line service, although times and fares were different. It was agreed that South Western Roadways and V/Line should unite their operations and run in V/Line colours. Although not titled a Link service, a co-ordinated operation now takes place.

Fares were reduced to the level V/Line had been charging, and within the first 12 months patronage was up 40 per cent.

The coach operating this service is the first of its kind to operate in Australia. Known as the long coach, its extra length provides seating for 60 passengers, a 25 per cent increase over that of normal single deckers.

Geoff Smithwick describes these service mergers as a "marriage of convenience" which benefits everyone concerned.

"This competitive regulation shows there is a viable future for the private bus industry working with the railways rather than against them," he said.

Recently a service linking Bendigo, Shepparton and Wangaratta was introduced. Called Midland Link, it operates on Mondays, Wednesdays and Fridays and connects with rail services between Wodonga and Wangaratta.

A glance at the map shows just how extensive the Link network is. "There are now a greater number of travel opportunities, especially to the major tourist centres, and the response from our customers has been very positive," said Geoff. "In many cases we've provided the missing link for travellers in country Victoria," he said. □

MORE THAN 100 WASHOUTS IN 61 KILOMETRES OF TRACK

Rail in the BIG WET

When Cyclone Joy began propelling her tempestuous self towards the North Queensland coast in earnest on Sunday, 22 December 1990 no one could have foreseen the prolonged havoc which would be unleashed or the mammoth task of cleaning up afterwards and maintaining essential supplies to communities.

"Joy," and a series of intense rain depressions, resulted in the worst disruption to rail services in northern and central Queensland for at least 30 years.

The financial toll so far is heavy — an estimated $22 million by the end of January. This includes $11 million in lost revenue, mainly on coal export traffic.

This summer's "Big Wet" came eight months after major flooding in central and southern Queensland in April last year which devastated the railway towns of Alpha and Charleville and cost Queensland Rail $8 million.

On 6 February this year, during the seventh successive week of disruption to train schedules in North Queensland, QR airlifted 183 stranded passengers on two chartered 737 aircraft from Rockhampton to Townsville. It was the third such exercise in just over five weeks.

Hundreds of QR staff have given Queensland Railways much to be proud of and have served their local communities with distinction in the huge task of restoration of track.

Superb staff response

Commissioner Vince O'Rourke said staff response was superb. "This is traditional of rail workers at times of community distress," he said. "We stand taller in the Queensland community for the efforts of those in the thick of the action in recent months."

Typical of those in the thick of it is QR ganger John Hogan. He gives the Cloncurry Raiders rugby team a good chance in the Mt Isa League premiership this year. John and several of his workmates have had an excellent pre-season workout as members of a railway gang working on flood repair near Cloncurry.

"We will be slimmer this time and fit, truly fit," said John, 34, and playing his last premiership season. "I've lost 16 pounds (7.2 kg) and am back to 13 stone (82.5 kg) since working on flood repairs," he said. For his gang, hand tools and crowbars were the stock tools of trade with workdays extending from 5.30 am to 8.30 pm.

The day began at Paymurra, a small siding 15 km east of Cloncurry. From there the men proceeded by work train to the first washout, and there were plenty of washouts — more than 100 in 61 km of track.

The achievements of ganger John Hogan and his 30 men near Cloncurry in north-west Queensland were extraordinary, but not unique. In 19 days they unloaded by hand:

BIG

hauling the load of more than fifty semis

MODERN

with current rollingstock and an on-going commitment
to upgrade terminal and handling facilities

VERSATILE

with specially designed wagons for most types of freight

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THE SUPER FORCE IN FREIGHT

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Fettlers, Malcolm McPhail (left) and Tom Lui at Dawlish Station Yard, Sarina, near Mackay, which was repeatedly flooded. Above # Jim Dou (reclining bottom left) checks the track level at Dawlish with supervisor Doug Wales (hand on hip). Lower # John Hogan's gang which unloaded 21,864 tonnes by hand at Cloncurry. Right # Townsville refreshment room staff (from left) Joan Thomas, Nicole Reardon, Janelle Gregson, Tanyo Brosnan, Lorraine McLean and Vicki Walker.

☐ 558 wagons of floodrock (support laid near ballast)
☐ 887 wagons of ballast
☐ 86 wagons of screenings; and
☐ 31 wagons of sleepers.

This amounted to 21,864 tonnes — equal to 37 tonnes per man per day.

John Hogan said this year's flood was one of the region's worst. "We average 6 ins (153 mm) of rain a year, but by early February we already had 30 ins (765 mm)," he said. Despite the long hours and heavy toil repairing a battered railway is fulfilling for him.

"After all, that's what the railway is all about — there's that bond; lots of blokes working as a team serving the community," he added. The long hours, however, meant less time for breeding Australian parrots, so John's wife Dianne helped out. The appeal of the parrots? Well, John and his wife say they are well-behaved, playful and easy to talk to.

An interesting sidelight to the huge rail repair task was the attention given to diet. John Hogan encouraged the men to eat more protein as the floods at times cut the supply of fruit and vegetables.

The work at Cloncurry had to be completed by hand because the black soil was saturated by heavy rain.

27 separate washouts

Track damage to some sections of the network in northern and central Queensland was particularly severe. Repairing 3km of track on the Mookarra section south of Bowen on the North Coast Line required:

☐ 700 sleepers for pigsty (which allows work trains to pass)
☐ 200 wagons of ballast; and
☐ 200 wagons of flood rock.

There were 27 separate washouts on this section, some of 60 metres long and up to 1.2 metres deep.

Townsville Traffic Superintendent, Ray Spencer said: "These are only statistics. They are only part of the picture. They don't tell you the human side — of Bill Evans, the Permanent Way Inspector at Bowen and his gangs working non-stop, being drenched as they waded through neck-deep water to clear the track . . . and of Les Hanlon and his gangs doing the same at Guru near Townsville."

Throughout central and northern Queensland track repair staff displayed the same level of spirit and dedication. Some on the Goonyella coal system, for example, worked almost continually in dreadful

conditions for up to four days between the Hatfield Range and Nebo.

Many sections of track went under water more than once which was particularly frustrating. For example, Dawlish, near Mackay, was flooded three times.

As well as the track staff, QR's train station and catering personnel were great ambassadors during the floods. Staff at Townsville, for instance, arranged a visit by Santa Claus to the stranded children on Christmas Eve, and for television receivers on the platform. At Mackay, delayed passengers bought a gift in appreciation for the efforts of staff.

The local media at Rockhampton carried several items where passengers congratulated train and station staff for their courtesy and thoughtfulness. Rockhampton itself was the worst-hit major rail and population centre. All rail links with the city were cut for a week as floodwaters rose to the 1954 peak.

General Manager of QR's Central Division, Frank Simmonds, who worked tirelessly said an excellent team effort — "track repair crews, station and train staff, train controllers, everybody really" — ensured the huge restoration job in the Central Division went as smoothly as possible.

He said close liaison between QR and Counter Disaster personnel in Rockhampton helped residents cope with the many problems resulting from the deluge of water in the low-lying parts. □

Recycling waste materials can be profitable

A rail and recycling centre operated by Freight Rail, a division of the State Rail Authority of New South Wales, sells about $740,000 in scrap metal a year to private companies in Australia and overseas, as well as reconditioning and recycling railway line.

Its annual turnover is about $1.73 million.

The centre handles:

- ☐ *Rail welding* which includes new rails in short lengths, and welded lengths up to 110 metres long in new and secondhand rail;
- ☐ *Rail reconditioning* which sorts, classifies and refurbishes secondhand rail for re-use in track. It also supplies rail for other uses (fence posts, etc) and sells surplus rail to private sector customers for reprocessing or scrap.
- ☐ *Recycling* which sorts various types of permanent way material for re-use in track or for sale to private sector customers, and sells useable material to scrap merchants all over the world.

The centre (originally the Rail Welding Depot formed in 1938) also acts as a holding depot for new rail on behalf of SRA's stores branch. Last year it held $5.4 million worth of new rail.

The centre has four office staff, two maintenance and 21 production employees.

Manager David Jackson has seen (and helped create) big improvements at the centre since he started there in August 1988.

Multiskilled employees

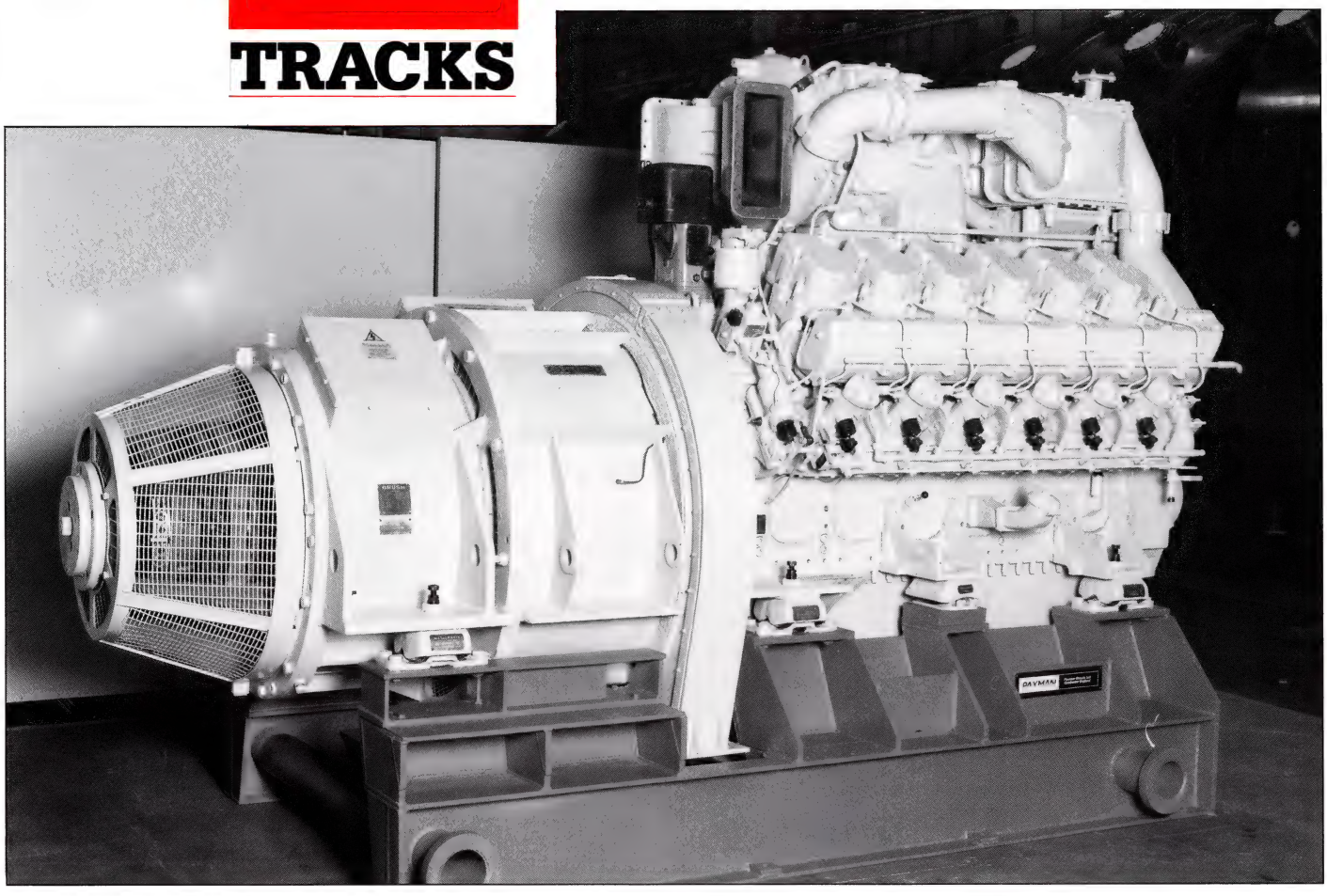
"Because most of our staff have learned to be multiskilled, and they can be very proud of that, they can operate all of the various machines as they move between the three operations," he said.

"We took in 7,950 tonnes of rail and scrap material last year and passed out 8,580 tonnes.

"We sold back to our engineering sections $340,000 worth of good-as-new recycled perway material such as dog spikes, rail anchors and sleeper and fish plates.

"As well, there were sales of $630,000 worth of reconditioned rail. That's like a double saving because we sell it back to our internal rail customers at less than half the new cost," he said.

"We didn't set out to make a profit — we just wanted to cover our operating expenses. But in the past two years we've been in the black by $156,100 and $74,900, mainly because of bigger than expected sales to the private sector." □



Another four (making 20 in all) of these 12-cylinder Valenta rail traction engines will be delivered this year to NSW's State Rail Authority for the high-speed XPT passenger services.

XPT POWER

The State Rail Authority (SRA) of New South Wales has ordered four more 12-cylinder Valenta rail traction engines from Paxman Diesels Ltd., England, for its high-speed XPT express passenger services. They will be delivered later this year.

Paxman has already supplied the SRA with 20 Valentas for the XPT program, 15 of which are in constant service while the others are held as spares.

The speed, comfort and reliability of the XPT have led to an increase in the number of passengers using the SRA network.

First introduced in the early 1980s, the XPT is based largely on the concept of Britain's High Speed Train (HST), also Valenta-powered, which holds the world speed record for a diesel train.

However, the demands put on the engines in Australia are different as they operate in substantially higher ambient temperaturers and on routes with steeper gradients, although at slightly lower top speeds. In order to accommodate these differences, engine ratings are changed to give increased reliability and time between overhauls.

The engines are designed to enable any maintenance work that needs to be done to be carried out in-situ with very few specialised tools, ensuring short out-of-service times.

The four new Valenta engines will be used to power the two new train sets serving the line to Brisbane.

The Valenta for the XPT is rated at 1480 kWb (1980 bhp) at 1500 rev/min.

During the 14 years that the Valenta has provided power for high speed trains, it has accumulated over 14 million running hours and experience gained from this has allowed major overhaul periods to be extended from 12,000 to well over 20,000 hours, further underlining the engine's economy. □

The Kershaw Track Stars:

Ballast Regulators

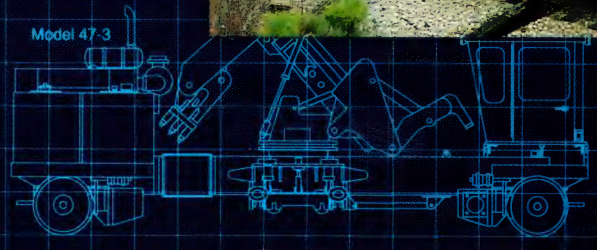
Kershaw's Ballast Regulators are powerful, fast machines for ballast shaping, shoulder profiling and a variety of other track maintenance operations. Snow and sand removal attachments can be added to make them the most versatile machines on the market today.

Sand Regulator

Tie Replacer 47

Model 46-6

26 Ballast Regulator

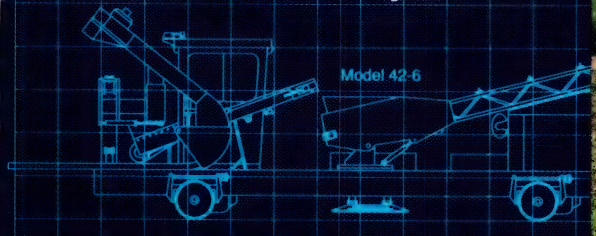


Model 47-3

Tie/Sleeper Renewal Equipment

The Model 47-3 Tie Replacer provides high production rates required to meet high-speed tie gang operations and is a key element in Kershaw's complete tie renewal system.

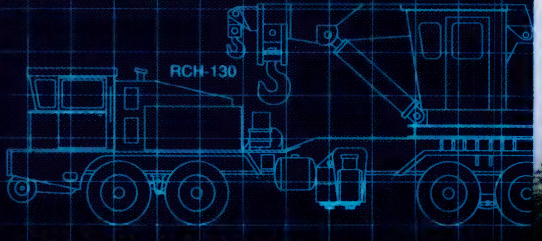
Track Undercutter 42-6



Model 42-6

Track/Switch Undercutters

The all-new Model 42-6 Track Undercutter represents the state-of-the-art in switch undercutting – designed to handle the complete job from start to finish.



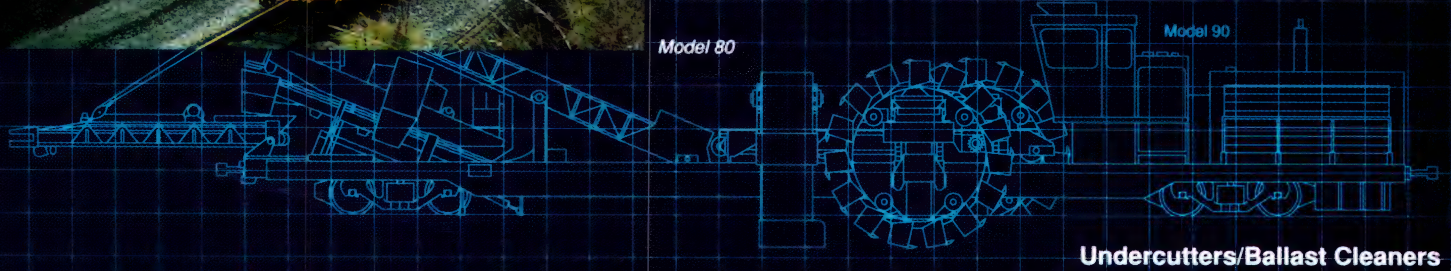
RCH-130

RC-130 Crane

Mobile Wrecking Cranes

Kershaw's line of high capacity, heavy duty cranes for road and rail are available with capacities from 50 to 150 tons — offering fast set-up, versatility, and efficiency.

Model 80



Model 90

Undercutters/Ballast Cleaners

For full operation undercutting without raising track, Kershaw's Ballast Cleaners offer high production rates and fast start up — ready to work within ten minutes of arrival at work site.

And introducing the high output ***Super System*** with production rates up to 2000 ft/hr (610 m/hr)
– There's NONE FASTER!

Also Available:

- Complete Line of Tie, Rail and Ballast Renewal Equipment
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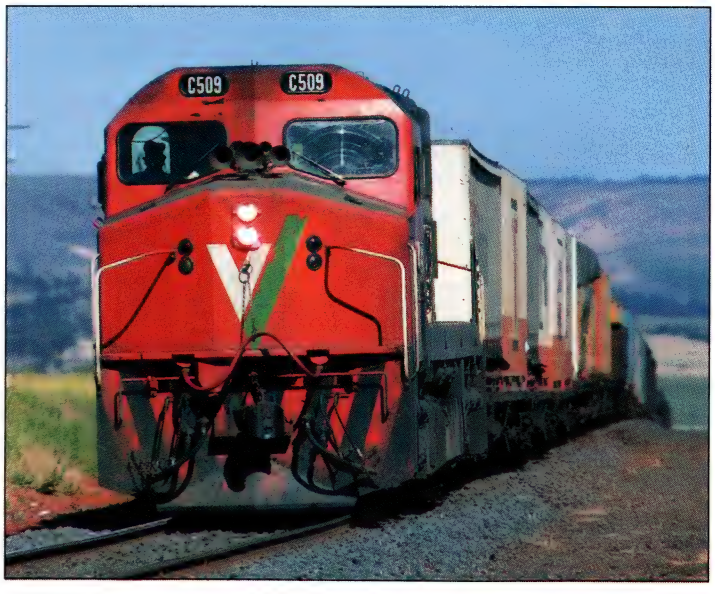
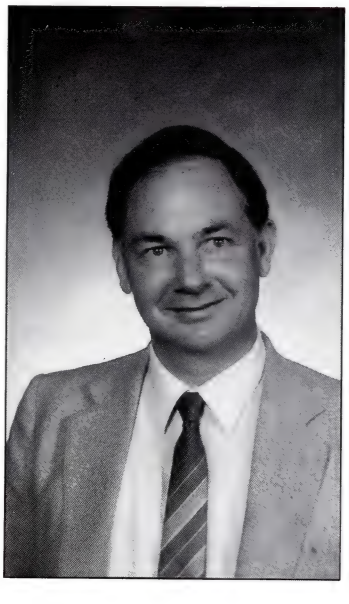
Saving better

THE WAR IN THE GULF HAS GIVEN IMPETUS TO A CONSIDERATION OF FUEL-EFFICIENT FREIGHT TRANSPORT IN AUSTRALIA. RAIL HAS CONTRIBUTED SOME REMARKABLE ACHIEVEMENTS. IN THE NORTH-WEST FOR EXAMPLE IT TAKES ONLY ABOUT ONE LITRE OF FUEL TO MOVE A TONNE OF IRON ORE SOME 426 KILOMETRES.
WHILE THERE ARE SOME IMPROVEMENTS TO BE MADE BY ELIMINATING TIGHT CURVES AND STEEP GRADATIONS ON SOME LINES AS

PHILIP LAIRD

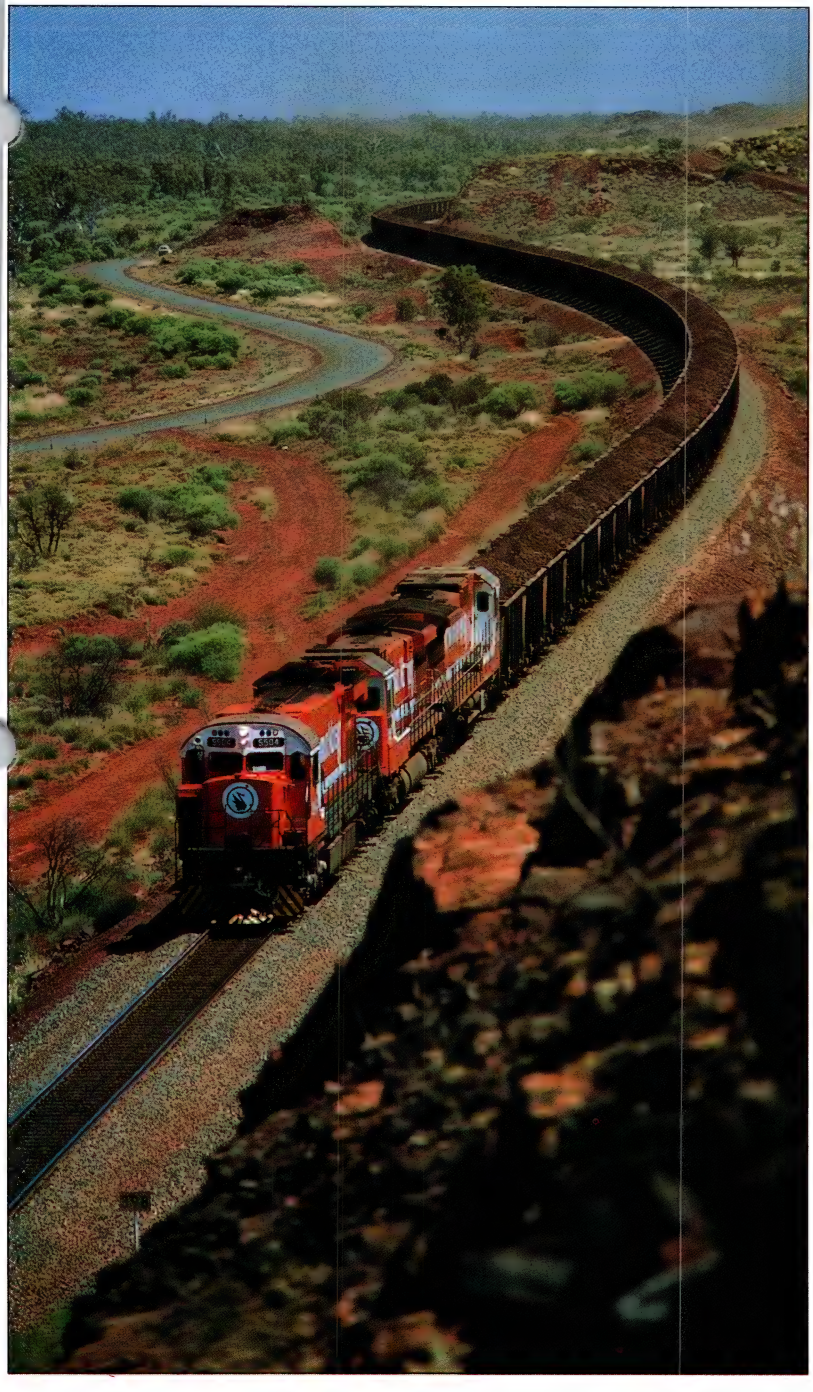
POINTS OUT THE ADVANTAGES OF A FIRST-CLASS FAST FREIGHT RAIL SERVICE ARE SECOND TO NONE.
DR LAIRD CURRENTLY IS SUPERVISING A LAND FREIGHT TRANSPORT ENERGY EVALUTION PROJECT AT THE UNIVERSITY OF WOLLONGONG SPONSORED BY THE ENERGY RESEARCH DEVELOPMENT CORPORATION WITH EMPHASIS ON THE SYDNEY-MELBOURNE CORRIDOR.
HIS TRANSPORT RESEARCH INTO ROAD FREIGHT COST RECOVERY, RAIL FREIGHT DEVELOPMENT AND ENERGY USE IN LAND TRANSPORT, HAS BEEN PUBLISHED IN THE PROCEEDINGS OF VARIOUS AUSTRALIAN TRANSPORT RESEARCH FORUMS.
DR LAIRD IS A LECTURER IN MATHEMATICS.





DR PHILIP LAIRD (left) advocates elimination of steep gradients like that at Parwan, Victoria, (above) and points out the high fuel efficiency of Western Australian ore trains, such as the Mt Newman train (right).

fuel with use of rail



Australia's land freight task has grown eight-fold to some 160 billion tonne kilometres during the past 40 years. Most of this growth has been due to the non-government rail sector and to the road freight industry. The freight task performed by the articulated trucks has grown fourfold from about 15 billion tonne km in 1971 to some 60 billion tonne km in 1988.

During this time, there has been a 120 per cent increase in the use of diesel to 2040 million litres a year by these vehicles over this time. This compares with a 32 per cent increase in the use of petrol by cars and station wagons to 13045 million litres a year over the same time span.

Recent projections of the freight task performed by articulated trucks are that it will double by the year 2000 and could rise to 150 billion tonne kilometres.

Despite the growth in coal exports serviced by government rail in Queensland and NSW over the past 20 years, the overall growth in the government rail freight task has been relatively small — doubling from about 25 billion tonne km in 1970-71 to 50 billion tonne km in 1987-88.

Rail has long had a reputation for energy efficiency in the movement of freight, with the Australian Transport Advisory Council noting in 1979 that rail is about four times more energy efficient than road for long distance freight.

Factors like this led to a Senate Standing Committee on National Resources in suggesting 1980 reconsideration of road taxation for trucks *". . . both in the light of the need to conserve diesel fuel because of the proven relationship between the load carried by a vehicle and the damage done to highways. Ideally Australia's interstate haulage should be by rail between city freight depots with local distribution by road vehicles."*

This theme was picked up by Railways of Australia in 1980 which showed that if 60 per cent of the total tonnage of long-distance freight then being moved by road were diverted to rail, some 85 million litres of diesel would be saved each year.

Rail has long held an enviable reputation for energy efficiency in the movement of freight, but the elimination of tight curves on major routes will mean faster times and even greater fuel efficiency.

Other fuel saving factors were outlined in an April 1980 *Network* article *Our Energy-Conscious Railway Systems.*

To the general public it would seem that once the world oil price fell in the early eighties, fuel conservation became of little note until revived in the late eighties by the greenhouse predictions and the current Middle East crisis. However, during the eighties, there were ongoing advances made in articulated truck technology improving their fuel efficiency even though some of this was lost with higher speeds to meet reduced transit times.

Rail freight has also seen gains in fuel efficiency on a number of fronts.

The result of energy efficiency measures to 1985 has been to save about 360 million litres a year for the diesel fuel used by articulated trucks (based on their 1985 freight task and an 18 per cent increase in fuel efficiency from 1976 to 1985 measured in net tonne km per energy unit) and 184 million litres a year used in Government rail freight operations (again based on their 1985 freight task and a 38 per cent increase in fuel efficiency from 1976 to 1985).

On the road freight side, heavier truck loads and increasing use of B-Doubles will save more fuel, while measures for rail include Queensland mainline electrification which is expected to save a further 128 million litres of diesel each year.

For many years it has been known that selected non-government or private rail freight operations have shown high fuel efficiencies (with one report showing their overall fuel efficiency in 1985 at least three times that of the average for all government rail systems). The main reason for this is iron ore haulage over modern railways.

A tonne 426 km on a litre

For example, the movement of iron ore from Mt. Newman to Port Hedland now uses, on average, a little more than a litre of fuel to move one tonne of ore some 426 km. Although gravity helps the

More rail ground in less track time with fewer passes

State-of-the-art computer-controlled system monitors complete grinding operation, assures constant horsepower

The Loram SPM-L Rail Grinder.

The advanced computer technology on board the Loram SPM Rail Grinder precisely controls the operation of sixteen grinding modules. The computer continually checks and senses grinding pressure and makes adjustments to assure constant horsepower and to maintain exact, predetermined angles. Multiple patterns can be stored and called up as needed. Grinding pattern changes can be made in seconds.

The SPM uses the latest technology in grinding stones so the proper amount of metal is removed, fewer passes are required and track time is reduced.

The Loram SPM removes long and short wave corrugations, rail defects and restores the proper profile to rail, switches and crossings. The system is accurate, efficient and your rail could last up to 300 percent longer — with less maintenance necessary.

The SPM is also available in a 32 grinding module configuration.

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LORAM

"So there is a case that work should now commence on upgrading certain mainline railways serving interstate and export trade."

loaded ore trains (except in crossing a range) going down to the port, fuel is used to take the empty wagons back, and an impressive fuel efficiency of about 375 net tonne km per litre results.

These excellent results are not only due to a mixture of old (ALCO) and new (GE Dash 8) locomotives and the use of 240 wagon trains (each with a 105 tonne payload), but also modern track laid in the late sixties with high axle loadings (32.5 tonnes) with a maximum grade for the loaded trains of 1 in 182 and for the empty trains 1 in 67. There are only nine curves of radius tighter than 800 metres, and the sharpest curve has a radius of 582 metres.

Compare this with the interstate mainline between Goulburn and Yass.

The ruling grade for north bound trains is 1 in 66 and for south bound trains there are at least 20 locations with grades steeper than 1 in 66 with some as steep as 1 in 40. No fewer than 60 curves have a radius of 600 metres or less, with many having a very tight radius of 360 metres.

The Sydney-Albury mainline track is basically of "steam age" alignment that has seen no improvement in grades since 1946, and freight operations over this track (in addition to crossing the Great Divide) require extra fuel over optimally located and aligned track. Improved Sydney-Melbourne route alignment was recommended by the Institution of Engineers Australia in 1981, and is part of the current Fast Freight Train proposal costed at $250 million by the National Freight Initiative Committee in 1990.

The adverse affect of steep grades and sharp curves was well shown in a 1980 ROA analysis that noted considerable variation between interstate routes for fuel intensities. These included 4.2 litres per 1000 trailing tonne km for Adelaide-Perth, and 10.2 litres per 1000 trailing tonne km for Sydney-Melbourne.

The ratio of these fuel efficiencies is a factor of about 2:5.

The difference is easily accounted for in the fact that the Adelaide-Perth track has gentle ruling (i.e. maximum gradients of 1 in 100 with curves of minimum radius 400m, whereas the Sydney-Melbourne track has locations with steep ruling gradients and/or tight curvature. Clearance restrictions and short length crossing loops (900 metres) on the Sydney-Melbourne line preclude modern intermodal rail freight operations and also reduce the scope for fuel savings.

Variation in rail freight fuel efficiencies in mainline rail freight operations of a factor of up to four were also recorded in a 1981 Bureau of Transport Economics study, that found "*. . . The disparity between the efficiencies of different parts of the railway system suggests that there is also considerable potential for lifting the maximum attainable efficiency of some railways by improvements to grading and alignment . . .*"

How much fuel could be saved?

How much diesel fuel could now be saved each year by rail moving long-distance freight? One estimate of this writer, based on 1987-88 freight consignments and assuming rail was able to lift its modal share to 70 per cent of land transport on each of the ten major interstate transport corridors linking the five mainland State capital cities (Perth, Adelaide, Melbourne, Sydney and Brisbane) is approximately 100 million litres per year. However, this assumption could well be regarded as unrealistic given the recent low modal shares on some corridors (eg Sydney-Melbourne at 30 per cent or less).

However, if the interstate mainlines in south east Australia linking Adelaide, Melbourne, Sydney and Brisbane were to be upgraded to Fast Freight Train standards, there would be three immediate benefits.

- ☐ Transit times for rail freight would become more competitive with road,
- ☐ Freight tonnages per unit of locomotive power would rise, and
- ☐ Rail freight fuel efficiency would rise.

The net fuel savings resulting from full upgrading of mainline interstate rail links in south east Australia (so as to give easier ruling grades and better track curvature), and with rail assuming 70 per cent of land transport on ten main interstate transport corridors linking the five mainland State capital cities, is then estimated to be some 200 million litres per year on 1987-88 freight consignments. Such a saving is about 10 per cent of the total fuel presently used by articulated trucks in Australia, and would require a transfer of some six million tonnes a year of long-distance interstate freight from road to rail.

It will not go unnoticed that such transfer would reduce uncovered road maintenance costs, and the expected cost of road accidents, estimated to total about $90 million a year.

The potential liquid fuel savings from selected mainline interstate rail upgrading would be much higher than 200 million litres a year in the late nineties. By then, Australia's annual oil import bill

IT TAKES, ON AVERAGE, LITTLE MORE THAN ONE LITRE OF FUEL TO MOVE A TONNE OF IRON ORE 426KM FROM MT NEWMAN TO PORT HEADLAND.

could be $5500 million at that time. So there is a case that work should now commence on upgrading certain mainline railways serving interstate and export trade.

Conservation of liquid fuels will also reduce air pollution and emission of greenhouse gases.

Reducing the impact of the greenhouse effect has been recently examined by the Senate Standing Committee on Industry, Science and Technology. In their report, *Rescue the Future*, the Senate Committee notes that many reports, including *Rail: Five Systems — One Solution* of the House of Representatives Standing Committee on Transport, Communications and Infrastructure, and *A Potential Extension of Intermodal Rail Services* by the former Inter-State Commission have canvassed the need for improvements in Australia's railways.

The Senate Committee found *"There is considerable evidence that much could be done to improve the rail system, both in terms of energy use and overall efficiency. Rail systems are potentially very energy efficient, if sufficient attention is paid to grades, curves and track standards . . . An efficient rail service could result in significant reductions in carbon dioxide emissions and large savings in Australian consumption of liquid fuels for transport services"* and urged *". . . that further action be taken to significantly improve the rail system."*

The formation of a National Rail Freight Corporation (NRFC) as of 1 July 1991 will be a significant step forward.

However, neither the $50 million made available by the Federal Government in 1990-91 for upgrading mainline interstate rail infrastructure nor the actual formation of the NRFC will provide the necessary funding to upgrade the mainlines linking Adelaide, Melbourne, Sydney and Brisbane up to Fast Freight Train standards.

Adelaide-Melbourne gauge standardisation is a further project that exceeds the capacity of the current government programs.

A Federal Government statement released in December 1990 responding to the report *Rail: Five Systems — One Solution* notes that the NRFC *". . . should be able to earn a rate of return sufficient to fund all investment from non-government sources (including internally generated funds) without reliance on government guarantees."*

This could be difficult when long-distance rail revenues are in part constrained due to heavy articulated truck operations in receipt of significant hidden subsidies. Even with a new national uniform charge system coming into effect on 1 July 1990, it could take some years to bring road cost recovery from heavy trucks to a full "user pays" level.

The progress made by Australian National (AN) whose mainland freight has made a profit for three years now is due to many factors.

The above-cited Government response notes that AN *"progressively upgraded (its) track, purchased new locomotives, developed and built new types of wagons, upgraded signalling systems, and improved terminal facilities."*

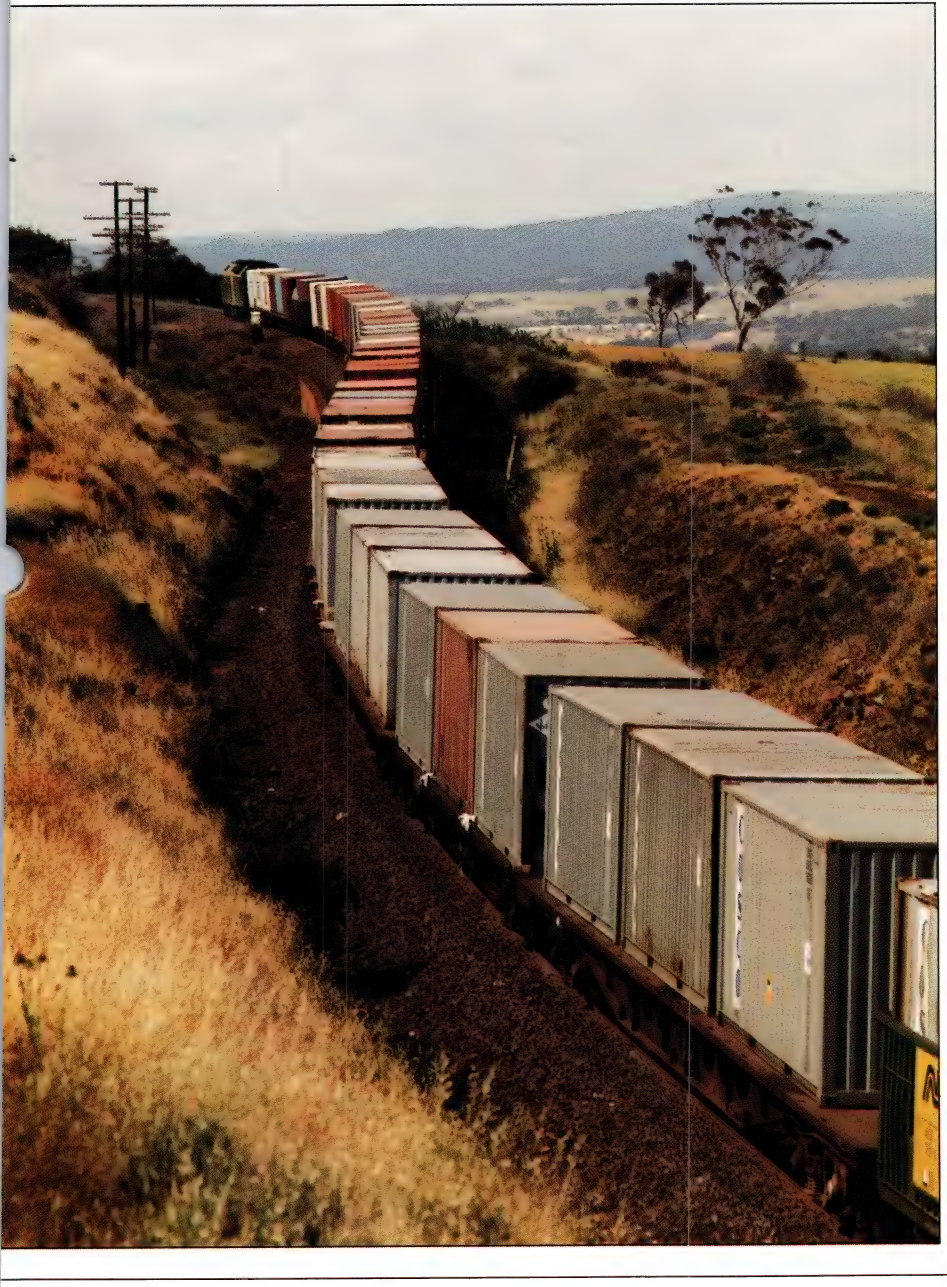
However, AN's good results are also due to operating (with Westrail) over track that over the last 25 years has been converted to standard gauge and world-class alignment as regards to gradients, curvature and clearances.

When the interstate mainlines in eastern Australia have been brought to the same standards as Western Australia (namely all standard gauge and all of world-class alignment as regards to gradients, curvature and clearances), significant savings in diesel fuel will result. In the meantime, partial savings are available by more use of the existing rail system for the movement of long-distance freight. □

Motive power centre

It takes just half an hour to fuel and service a locomotive at Dry Creek. Pictured (left) is the servicing bay. Multi-skilled staff (lower left) help to keep the centre operating 24 hours a day seven days a week, the rapid turn-around ensuring the efficient operation of trains (lower) on the fast interstate run.

at Dry Creek



A team of multiskilled workers at Australian National Railways' new $13.2 million Motive Power Centre at Dry Creek, near Adelaide, can fuel and service a locomotive in half an hour introducing a new era in Australia for locomotive maintenance.

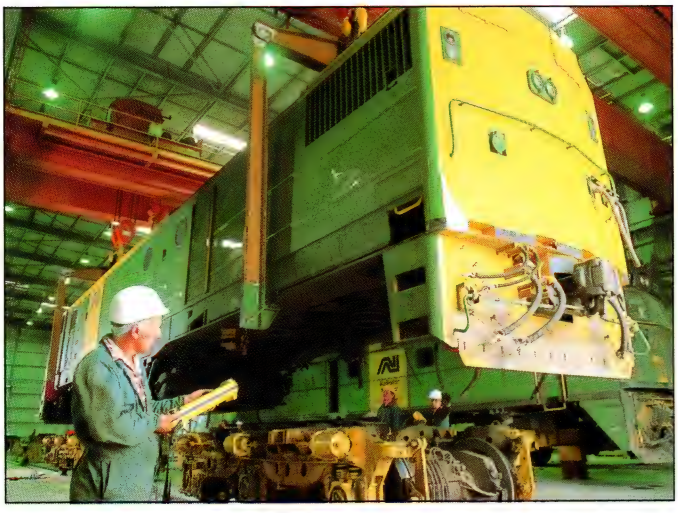
Building the centre began in July 1989 with the aim of centralising AN's locomotive service, repair and overhaul facilities to reduce costs and streamline operations.

More than $1.5 million was saved through the re-use of AN assets including two 50-tonne gantry cranes from Port Augusta, a turntable from Gladstone, mixed-gauge turnouts from Wallaroo and the Mile End diesel depot, and rail and trackwork from rail recovery in the mid-north.

The centre was officially opened by Federal Land Transport Minister Bob Brown at a ceremony at the Dry Creek facility on Monday, 8 April.

"In our bid to speed throughput, the Motive Power Centre employs the most up-to-date locomotive servicing technology available," said AN technical services manager, Andrew Neal. "It is comparable with the best operated by a rail system anywhere in the world; however its ultimate success will hinge on the multiskilled workforce which staffs it.

"The aim is to process locomotives through the servicing system and back into operation in the shortest possible time. Providing there are no complicating factors, a 30-minute turnaround time is feasible."



Australian National's new motive power centre incorporates a maintenance facility for major overhauls (top left) and employs the most up-to-date locomotive servicing technology. The fuel management system (right) located in the servicing bay demands locomotive identification before supply is authorised. Training has commenced for locomotive maintainers, a new work classification combining all trade skills.

Training has begun for multiskilled locomotive "maintainers," a new work classification combining all trade skills.

Located a few hundred yards from the Dry Creek South maintenance area and Dry Creek North marshalling yard, locomotives due for service can be moved from either yard to the centre in a matter of minutes. This is a vast improvement on previous servicing operations based at Mile End.

It took about 45 minutes for a locomotive to travel from Dry Creek to Mile End.

The service centre operates 24 hours, seven days a week, handling minor maintenance including brake block replacement, locomotive sanding, refuelling, cab cleaning and minor quick-fix repairs.

Three tracks offer standard and broad gauge access to the maintenance facility and two tracks provide access to the quick-fix servicing area. Computer-monitored locomotive fuel usage helps reduce running costs.

Sanding is carried out by a motorised gantry running the length of the locomotive with a high-tech monitoring system keeping spillage to a minimum.

Locomotives are cleaned by forklift-mounted power washing machines and a computer-controlled safeworking system monitors traffic on the diamond entry into the centre.

The introduction of the Motive Power Centre ends the time-consuming maintenance operations of the past where broad and standard gauge locomotives were serviced at Mile End diesel depot and overhaul operations split between Port Augusta and Islington workshops.

The new centre eliminates costly duplication of maintenance and sevicing operations. It is supported by a $3 million upgrade of the Port Augusta workshops, boosting its diesel engine repair operations.

Baulderstone Hornibrook Engineering Pty Ltd was the main contractor involved in the building of the Motive Power Centre. The centre was designed under contract by Kinhill Engineers in close collaboration with AN engineers Peter Simons, Lyall Hamilton and John Fullerton. □

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V/LINE TRAVEL

Going places!

MOVING NORTH

PERTH'S TRANSIT SYSTEM IS PROGRESSING INTO THE NORTHERN SUBURBS. PLANNING MANAGER FOR THE PROJECT, RICK LEONHARDT (LEFT) DISCUSSES A MODEL OF THE ROE STREET TUNNEL WITH THE EXECUTIVE DIRECTOR URBAN RAIL DEVELOPMENT, JOHN HOARE, PICTURED RIGHT IS WESTRAIL'S NEW EMU ELECTRIC TRAIN.

The Northern Suburbs Transit System is beginning to take shape in Perth with the start of the first major construction work, the Roe Street tunnel, heralding one of Western Australia's largest public works projects to cost around $223 million.

Work on the $4.3 million contract to build the tunnel began in mid-January and is scheduled for completion mid-year. The second stage of the tunnel — excavation, flooring, roofing and fitting out — is due to begin soon for completion by November.

In dollar terms, the rail project is the State's biggest since the completion of the final stage of the Muja power station five years ago. The Roe Street tunnel is the first part of a proposed 29-kilometre Perth to Burns passenger line.

The tunnel is the first major structure on the new line and will take new electric trains under the Fremantle line and under Roe Street at West Perth into the centre of the Mitchell Freeway reserve, nearly half a kilometre away. In a total tunnel length of 450 metres, 130 metres will be underground.

A great deal of the preparatory and design work for the new railway has been carried out under the management and guidance of the Northern Suburbs Transit System project engineers, consultants and other technical staff, during the 12 months or so since approval was given to start this massive project.

"Many talented people in a range of disciplines are working hard to bring the transit system into being," said John Hoare, executive director of Urban Rail Development. "They have achieved a tremendous amount in the short time since the State Government decided to go ahead with the rail option for the northern suburbs."

New electric trains

The first of the new state-of-the-art electric trains is due to run on Perth's new Northern Suburbs line by the end of 1992. Like all trains in the suburban system, they will be operated by Westrail for Transperth.

The $90 million order for the 22 pairs of rail cars for the line has been placed with Queensland manufacturers. The cars, designed to operate in sets of two, four or six, will be the same as those already delivered for the electric services on Perth's existing three lines and will be interchangeable.

Transport planners predict the Northern Suburbs line will become the busiest in the metropolitan area. An estimated 40,000 passengers a day are expected to use the system by the year 2001.

The air-conditioned rail cars, operating at speeds up to 110km/h, are scheduled to operate at five-minute intervals between Whitfords and Perth in the rush-hour periods. The journey will take about 16 minutes.

Bus 'n' Ride passengers, who are expected to make up 60 per cent of people using the Northern Suburbs system, will be able to make the whole trip under cover.

There will be seven stations — Glendalough, Stirling, Warwick, Whitfords, Edgewater, Joondalup and Burns — and all except Joondalup and Burns will be built in the middle of the Mitchell Freeway reserve. The bus transfer stations, at Stirling, Warwick, Whitfords and Joondalup, will have elevated bus decks, connected to the rail platform below by escalators so that passengers will have a rapid switch from bus to rail.

First for Australia

It will be the first time such a design, pioneered in the United States, has been used in Australia.

The line will be constructed in the centre of the Mitchell Freeway reserve and preparation work has begun near Lake Monger, where new northbound carriageways will be built leaving a central median for the railway. Trucks working under a Main Roads Department contract have begun depositing sand which will become part of the new freeway formation. Additional sand will be placed in the area to surcharge the ground.

The weight of the extra sand is used to squeeze out water from the underlying peat soils and compact it so that movement is minimised after the freeway and railway line are built.

The new line will offer people in the northern suburbs a level of public transport not enjoyed before in Perth. "It will bring tremendous benefits to the whole corridor," said the project's planning manager Richard Leonhardt. "It will allow many people to leave their second car in the garage, or even get rid of it altogether. That's bound to be a major saving for a lot of families.

"A major side benefit of the new railway will be the better bus services that will be needed to take people to and from the stations," he said. □

The powerful EL51 hauls the Indian-Pacific across the world's longest straight stretch of railway track.

INDIAN-PACIFIC UPGRADE UPDATE

Expressions of interest in upgrading the Indian-Pacific train to what Australian National believes will be one of the world's greatest trains are being reviewed, but there is no indication yet when the work will commence.

The broad details of a proposal to improve the quality of the Indian-Pacific which crosses Australia east-west were included in AN's 1989-90 annual report to Federal Parliament.

AN believes the service can be as successful in the tourist trade as the upgraded Ghan service to the centre of the continent. Since completion of The Ghan upgrading last year passenger numbers have risen by 33.6 per cent in the coach class and by three per cent in first class.

March this year marked the 21st birthday of the Indian-Pacific service and the standard gauge link between Perth and Sydney from which it takes its name. Spanning the continent across 4,348 km the standardisation of the Trans Australian Railway track over which the Indian-Pacific operates, took nearly 60 years.

The first Indian-Pacific ran on the trans-continental standard gauge line on March 1 and 2, 1970, from Perth and Sydney respectively. New rolling stock was built which, together with completion of the standard gauge link, cut travelling time from five days to around 65 hours and eliminated four changes of train.

Standardisation of the track began in 1912 when rail gangs started work on September 14 at Port Augusta on the Kalgoorlie-Port Augusta section. Work began at the Kalgoorlie end in February 1913, the link was made on 17 October, 1917, and the first passenger train ran from Kalgoorlie to Port Augusta on October 25 of that year.

In July 1937 the extension from Port Augusta to Port Pirie was completed, but it wasn't until the end of 1969 that the line between Port Pirie and Broken Hill was open for traffic.

Australia's capital cities were joined by standard gauge when the final link was opened between Crystal Brook and Adelaide in 1982.

PAY PHONES FOR V/LINE COUNTRY TRAINS

Mobile pay phones are being installed in V/Line's "N" and "S/Z" car sets. The new telephones will operate in an area radiating from Melbourne and as far afield as Sale, Albury, Cobram, Bendigo, Ballarat and Geelong.

Passengers will be able to use the phones on insertion of a $2 coin, and additional $2 coins when the time has nearly expired. The first coin covers 90 seconds and additional coins a further two minutes.

PRIVATE FUNDS FOR STATION FACELIFT

Private business contributed money to assist a $500,000 refurbishing project at busy Pymble station on Sydney's north shore. This type of upgrading financial arrangement is a first for CityRail.

The refurbished station was opened recently by NSW Government Transport Minister, Bruce Baird. He said about 20 per cent of the funds came from the private sector.

Company funding had allowed the project to be completed a year ahead of schedule. A commemorative plaque at the station lists the names of sponsors.

Among them are 3M Australia, the Abi Group, Rank Xerox, Pizza Hut, Pirelli Tyres, Atlas Air, KBH Constructions, Concurrent Computers and Wormald Security.

FOUR 81-CLASS ENGINES FOR SRA

The State Rail Authority in New South Wales has ordered four new 81-Class locomotives to join its existing fleet. They will go into service with the Freight Rail Division to help upgrade freight services in country areas.

The 81, from Clyde Engineering, Bathurst, is powered by the 16-cylinder, turbo-charged two-stroke EMD645 series engine, thousands of which are giving reliable service to railways around the world.

The AR16 generator provides power to the D77 traction motors. The selected gear ratio allows a maximum service speed of 113km/h and a continuous rated traction effort of 337kN.

The proven "super series" wheelslip control with back-up systems increases rail adhesion and tractive effort under all weather conditions and the Extended Range Dynamic Brake is capable of absorbing 2.6MW from the motors, an absorption capability higher than the traction power of the locomotive.

Clyde has produced over 1200 diesel locomotives since 1950 and few stand higher as proven performers, enjoying economic reliability and long service life than the 81-Class.

Currently 81-Class engines are being used on the fast Sydney-Melbourne Super Freighter run, and on northern NSW coal fields pulling incredibly heavy loads at slow demanding speeds.

The new 81 Class (top) looks smart in its new State Rail colours. A huge overhead gantry lowers the bodywork onto its chassis at Clyde Engineering where the 81 is manufactured.

MOTHER AND DAUGHTER APPRENTICES

State Rail in NSW has its first mother and daughter apprentices. They are Margaret Turner, BA, a slim energetic mother of four, and her daughter Amanda Weir, 20, a third-year apprentice electrical fitter.

Margaret, a former postal clerk, cleaner, tea lady, electoral roll review officer, and teacher, was accepted recently as a telecommunications apprentice.

A woman with very definite ideas she was widowed about 10 years ago with four young children, but has since remarried. To help husband Ken renovate their Liverpool home she did a building and construction course by correspondence.

She leaves home by 5.40 a.m. each day to attend the Chullora Training College as part of her apprenticeship training. Then after work she drops in at the gymnasium for a workout before walking home.

SRA's chief technical training manager, Max Flood, said almost half the 1991 apprentice intake of 207 people had their HSC; three were aged 40 or more and there were others aged 30 and higher.

The Prospector train (right) carries guests on an inspection of Kwinana grain terminal, Western Australia, following opening of the new balloon loop.

WA's BIGGEST NARROW-GAUGE GRAIN TRAINS

Transporting up to 113,000 tonnes of grain a week to the shipping ports of Kwinana, Geraldton and Albany Westrail this summer introduced its biggest narrow-gauge trains yet, each 50 wagons long and hauled by double-headed P-Class locomotives.

Each 741-metre train carried more than 3,000 tonnes of grain. The P-Class engines have much greater hauling ability and increased fuel efficiency compared with locomotives used in other grain seasons.

Westrail's new balloon loop costing $2.4 million at Kwinana's grain terminal saves time by allowing trains to remain intact during unloading. The old track layout meant engines had to detach and run around to the other end.

Seven standard gauge and two narrow gauge trains a day used the loop during the peak of grain delivery. Westrail has a five-year rail delivery contract with the grain industry.

FIFTY NEW DIESEL RAIL CARS FOR SA

Fifty air-conditioned stainless steel diesel rail cars costing about $150 million are being built for the State Transport Authority of South Australia at Campbellfield, Victoria. Fitting out and some component manufacture will be undertaken in Adelaide.

The first of these modern 3000 class cars is scheduled for service next year, and then at the rate of 10 cars a year.

Seating capacity of each car is 113 and interior fittings are arranged for maximum passenger comfort. Of the fifty cars, twenty-two will have dual driving cabs to allow single unit operation in either direction and twenty-eight will have single cabs for permanent coupling into multiple units.

The STA has selected the use of Scharfenberg couplers at each end of the cars for automatic coupling both mechanically and electrically.

This will facilitate and speed up marshalling of the cars for single and multiple unit operation.

Top speed of the cars is 100 km/h. Power will be supplied from an MTU V12 diesel engine with close coupled alternator rated for 360 kW at 1500 r/min constant speed.

The traction system, supplied by ABB Stromberg, is of the modern three phase AC type with inverter control. Two AC induction motors are mounted in one bogie. Bogies are being manufactured by Clyde Engineering under license from Linke Hofmann Busch of West Germany.

WORLD CONGRESS ON HIGH-SPEED RAIL TRAVEL

The International Union of Railways (UIC) is planning an international congress on high-speed rail from 27 to 29 April 1992 in Brussels. This follows a seminar on the subject held late last year in Berlin.

The seminar was the first on high-speed rail and was attended by representatives of all European railways. It laid much of the groundwork for an expansion of high-speed rail networks throughout the European continent.

The UIC is compiling a volume of the papers presented at the seminar. Copies will be available from the Union Internationale des Chemins de fer (UIC), 16 rue Jean Rey F 75015, Paris, France.

AWARD FOR EARLY WARNING DEVICE

Development of an early warning device for the slip areas of the Illawarra line running south from Sydney has won a prestigious engineering award for NSW CityRail signalling and civilian staff.

The devices will operate at 19 locations. Up to four slip detectors have been installed at one site.

Whenever there is ground movement, indicating a likely slip, the detectors automatically change line signals to stop. The track then has to be inspected and certified before the resumption of normal traffic.

The slip detector is inside a tool-box size galvanised steel box and is connected directly to the signalling network. When activated by ground movement, as well as stopping traffic, the device sounds an alarm at Wollongong control centre.

The detector won a Highly Commended citation at the Australian Engineering Excellence Awards last year.

One RoadRailer train can carry as much freight as 60 to 100 road vehicles.

ROADRAILER ON THE MOVE

Australian National will build 10 more RoadRailers for trial use by the freight transport industry to demonstrate the versatility and economy of the multi-function road/rail units.

The RoadRailer is a semi-trailer road vehicle which quickly and easily converts to rail transport.

Tenders were called in November last year for five new variations of RoadRailer, with the first of the new units expected to come on-line by April, complementing the six units already in service — four pantechnicons and two flat tops.

The new range of RoadRailers will include two curtain-sided units for easy access side loading, two fridge vans, two tankers for bulk liquids, two tippers for the transport of bulk, dry freight and two skeletel trailers for the hauling of containers.

RoadRailer is an answer to the dangers and diadvantages of road transport. A single RoadRailer train can haul as much freight as 60 to 100 trucks, considerably reducing traffic pressures on our already overloaded national highways.

"The new units will give the industry the opportunity to experience and test the efficiency of RoadRailers specially designed for a variety of applications," RoadRailer sales manager Esmond Fernand said.

Australian National currently is negotiating with Westrail, the State Rail Authority of New South Wales and V/Line to operate RoadRailer on interstate rail corridors.

NEW OUTDOOR ADVERTISING ARRANGEMENT

NSW State Rail has signed a seven-year management agreement for its extensive outdoor advertising business. The contract with international media company division Peal and Dean Poster Ads is estimated to be worth $52 million. It covers all aspects of sales, marketing, servicing, new development and redevelopment of railway poster advertising.

It involves 3500 displays on State Rail land, property and stations, including Sydney's underground network.

Peal and Dean is an Australian subsidiary of the world's largest outdoor advertising operator, Avenir Havas, of France.

It has major operations in Europe, the UK and Asia, and particular experience with railways in London, Singapore and Hong Kong, and with airports in London. Hong Kong, Singapore and New York.

NSW TO REPLACE 26 TIMBER RAIL BRIDGES

Country rail services in New South Wales will benefit with the replacement of 26 railway bridges and a major upgrading of track and signalling facilities following the advance of $12.8 million to the State Rail Authority by the Federal Government.

The bridges to be replaced are all-timber constructions on the north coast rail line. Their replacement will cost $5.5 million.

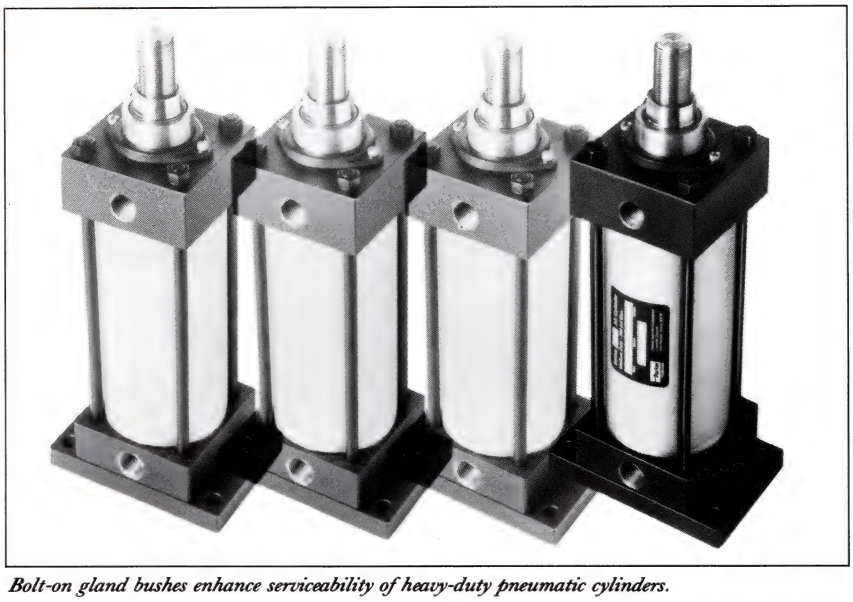
An additional $6 million will be used to extend crossing loops and to fund upgrading work on rail track and signalling on the interstate north coast and main western lines.

$1.1 million will be spent upgrading freight terminals in Sydney.

NSW Transport Minister, Bruce Baird, says: "Our investment program centres on the main interstate rail links which will become an integral part of the National Freight Corporation's network. There is strong community support for more long-distance freight to be moved by rail. Obviously, the more freight moved by rail, the less trucks on our roads."

NEW PRODUCTS & PROCESSES

Information and photographs about new products and services available from Australian companies serving the rail transport industry, particularly those relating to new technological developments, should be forwarded to the Editor, Network, Railways of Australia (Services) Pty Ltd, Level 4, 85 Queen Street, Melbourne 3000.



Bolt-on gland bushes enhance serviceability of heavy-duty pneumatic cylinders.

New bushes benefit cylinder servicing

Optional bolt-on gland bushes designed to enhance the serviceability of Parker Hannifin's Series 2A heavy duty pneumatic cylinders are now available.

The bolt-on design of the new bushes permits their easy removal without the need to dismantle cylinders.

Series 2A cylinders are widely used by the manufacturing, mining, materials handling, transport and other industries. Specific applications include hopper door actuation on coal wagons.

Enquiries: George Higgins, Product Manager, Pneumatics, Parker Hannifin (Australia) Pty. Ltd., Private Bag 4, Castle Hill, NSW 2154.
Telephone (02) 634 7777.
Fax (02) 680 4445.

BHP Stainless launches new 3CR12 product

BHP Stainless has launched Cromasteel 12, a range of circular, square and rectangular hollow sections manufactured from its proprietary 12 per cent chromium steel, 3CR12. In the form of sheet and plate, 3CR12 has gained wide acceptance in industry in the past ten years for its cost-effective delivery of corrosion resistance, durability and ease of fabrication.

BHP Stainless sees Cromasteel 12 being used in applications where corrosion and wet abrasion are problems, and where long-life and low maintenance are called for. Cromasteel 12 is particularly suited to the mining, sugar and transport industries, where 3CR12 has already been proven in years of service, the company says.

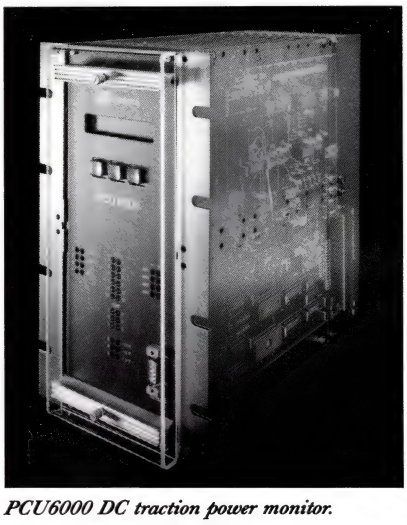
Cromasteel 12 is available in a size range of 25x25mm to 80x80mm squares and equivalent rectangles, and circular sections to 101.6mm OD, in standard wall thicknesses of 2mm and 3mm.

The product is available Australia-wide through Atlas Steel, Tube and Pipe Sales and Tubemakers Metalcentres.

Protection and control of power supply

A new system to survey and control all the power supply devices of a DC traction network has been developed by Secheron Ltd. of Geneva.

The PCU system offers the possibility of a progressive implementation from line-feeder protection to complete control of the power supply of a DC traction network.



PCU6000 DC traction power monitor.

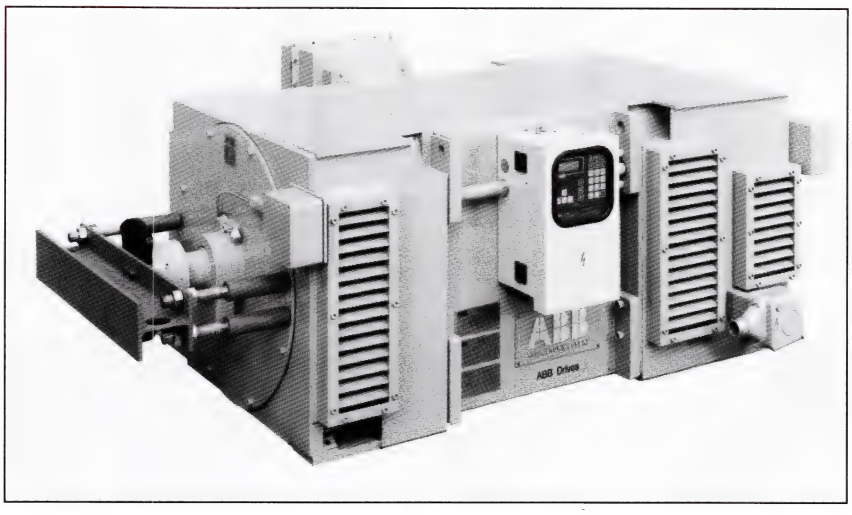
It covers all types of traction systems, from light rail transport to heavy-duty systems and from conventional to advanced technology propulsion packages.

The PCU has internal functions such as self-diagnostic, self-adjustment to optimal parameters, and many others. Its control functions include switch on after line test, and tripping sequence of an electrically operated breaker, as well as intertripping.

It can handle detection of line faults by dI/dt and-or overcurrent analysis, and falling voltage detection. It has LCD display, RS-232 front socket for link with an external PC or printer, send RS-485 interface.

Enquiries: Secheron SA,
CH-1211 Geneva 21.
Telephone +41 22 739 41 11.
Fax +41 22 738 73 05.

Part of King's new Wizard range.



ABB's Driveguard monitoring system mounted on a synchronous motor drive.

King secures Wizard range

King Materials Handling of Melbourne has secured the sole agency to The Wizard range of battery-operated lift trucks.

Three straddle trucks are available, with outrigger internal dimensions of 580mm, 800mm & 1200mm (std. pallet size).

With a push of the lever the battery-operated hydraulics easily raises a 750 to 1000 Kg load (depending on the modeling).

To be truly internationally competitive, the construction criteria required that a) The materials used were of the highest quality., able to withstand loads far in excess of the actual ratings. b) That the available power would be more than sufficient to last a full 8 hour shift without recharging c) That the cost would be world competitive. d) That the design would ensure easy and comfortable use, and is aesthetically pleasing.

King has plans to release in the near future, a range of innovative attachments to The Wizard.

For further details of The Wizard range, and the latest King materials Handling brochure, contact Ron Mileham. (03) 752 2774.
Fax: (03) 758 3515.

Monitor for electric motors

Rotating electrical motor drives call for an extremely high availability rate, something which is only achieved by constant monitoring of the operating status.

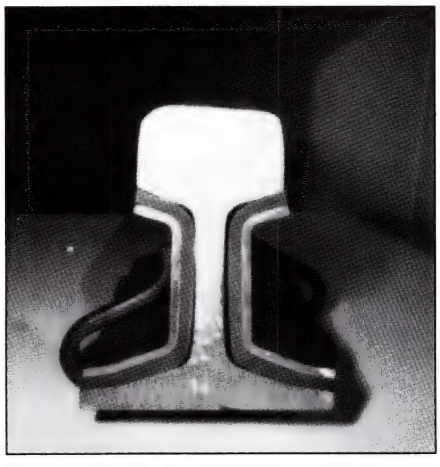
Driveguard, a monitoring system from ABB Drives, guarantees this uninterrupted flow of information, recognising faults in advance and avoiding costly repairs.

This system monitors the temperature of 24 PT100 temperature transducers, the vibration of 6 vibration velocity sensors, motor speed with 2 independent channels, and 8 binary inputs (auxiliary contacts).

Driveguard continuously monitors signals coming from the sensors with respect to the limits set. If a limit is exceeded, the equipment signals this on the display and activates relay contacts.

The actual values, their permissible limits and physical units can be read in plain text from the four lines of the display. Using the keyboard, the analog or binary parameters which may be changed in operation can be selected and changed by means of a "higher/lower" function.

Enquiries: Mr R. Kury, ABB Drives AG, CH-5300 Turgi, Switzerland,
Telephone ++41 56/29 21 01.
Fax ++41 56/28 20 53.



Cross-section of Phoenix AG's noise-absorbent material.

New noise absorber

Phoenix AG of West Germany has been involved in railway technology for many years in Australia, including involvement with bogie products, track fastening systems, tunnel track isolation matting, rail track sealing sections and various other rubber to metal parts.

An entirely new type of noise absorber developed in conjunction with the Hoesch company reduces the secondary noise emanating from rails at curves — the familiar "curve screeching" — to an acceptable level.

Enquiries: Phoenix, 26 Mockridge Street, Wantirna South, Victoria 3152.
Telephone (03) 800 3360.
Fax (03) 800 3349.

Mr Maurice Jefferies, formerly of Westrail, with his Align-It software.

Alignment of rotating gear

Align-It, PC based software for the alignment of rotating equipment was launched by JM Technologies in late 1990. The product targets medium to heavy engineering applications, examples being power units coupled to generators, compressors and pumps with driveshafts and flexi-couplings.

JM's Technical Manager, Mr Maurice Jefferies, based the product on a main frame program which he developed as an employee of the West Australian Government railways, Westrail. Mr Jefferies received the prestigious C. Y. O'Connor award for the mainframe program, which has been used successfully by Westrail for several years.

Align-It covers a range of different alignment situations and includes a unique "what if" reverse calculation facility to assess the affects of different packing combinations. The product includes comprehensive on-line help and user's guide making Align-It virtually self-instructional. The whole package is designed specifically to be used by tradepersons or engineers on the shop floor.

Mr John Corrigan, JM's Business Manager, emphasises that investment in Align-It offers reduced downtime for the alignment process and improved accuracy, enhancing bearing and coupling life. The package is very competitively priced compared with other imported software.

Enquiries: JM Technologies, PO Box 274, Midland 6056 Western Australia. Telephone (09) 483 6520. Fax (09) 444 7107.

Simple idea improves loco reliability

A fitter's simple idea that has just topped British Rail's "Best Suggestion of the Year" competition, will save more than $250,000 a year on diesel locomotive maintenance.

Mr Norman Beamon wins a total of $30,000 for his idea of an improved method of fitting replacement exhaust systems to Britain's Class 47 diesel-electric locomotives.

He has now developed his suggestion to the point where a total of 443 locomotives will be modified to accommodate it.

Mr Beamon, aged 40, recognised that during the replacement of locomotive exhaust systems there was insufficient support to the top turbo-pipe, which often led to broken set screws in the turbo flange because of misalignment.

He devised a support bracket fitment between the top and bottom exhaust pipe sections that will now ensure more accuracy in the assembly of the exhaust.

He was one of seven BR staff to receive cash awards for their money-saving ideas. Their contributions included a modification to prevent expensive component damage during maintenance of electric locomotives, a simpler and more effective method of measuring brake efficiency of Pacer diesel multiple unit trains, and a new method of handling concrete slabs which form level crossing roadway sections.

Enquiries: British Railway Board, Euston House, 24 Eversholt Street, PO Box 100, London NW1 1DZ. Telephone +44-71 922 6901. Fax +44-71 922 6525.

MTU engines for Adelaide passenger cars

MTU Australia has won a multi-million dollar contract for the supply of diesel engines to power 50 new passenger rail cars to be introduced on Adelaide's suburban rail network by the State Transit Authority of South Australia.

The order follows an earlier contract for MTU engines used in the Authority's current complement of 20, Series 3000 rail cars, the first of which entered service in 1987.

Representing the latest advances in diesel-electric rail car technology, each vehicle has an MTU 12V 183 TE 12 diesel of 407 kW (554 H.P.) coupled to an alternator producing 442 kVA which powers axle mounted A.C. squirrel cage induction motors driving the wheels.

The MTU engines feature a split circuit cooling system which at operating RPM provides cooler air, thus increasing the volume of air delivered to the cylinders for optimum power.

Enquiries: MTU Australia Pty Ltd, 11-13 Garling Road, Kings Park NSW 2148. Telephone (02) 671 3555. Fax (02) 831 1902.

Out of Steam
by Robert Adley

Patrick Stephens Limited, UK. $45

The late Lord Beeching (below) was "roundly cursed; richly praised; rarely ignored," according to the controversial Robert Adley.

The reshaping of railways

Changing the structure of railway services and systems inevitably invokes some emotional response. Anger at the closure of little-used branch lines in Australia is one example. In Britain, it is the Beeching Report officially entitled "The Reshaping of British Railways" which seems still to induce some wrath in railway enthusiasts almost 30 years on.

In this new book, Robert Adley, a member of the UK Parliament since 1970, reveals a personal prejudice in looking back on what he calls the "infamous Doctor's report on the future of Britain's nationalised railways."

Implementation of the Beeching Report transformed the railway services in Britain and caused considerable emotional reaction.

It brought about the final years of steam, and the closure of many branch lines throughout the United Kingdom — perhaps causing more trauma than similar action in Australia because the idyllic nature of many UK branch lines was held in such loving reverence by so many. In Australia it was mainly the voice of relatively few disgruntled farmers which was raised in protest.

Such was the emotional response in Britain that until now the effect of the Beeching Report has never been seriously scrutinised in the light of the current political, social and economic climate. Robert Adley's book fills that need.

Lord Beeching's proposals were influenced by assumptions of the inexorable growth of road traffic, but what he and his contempories never foresaw was that the self-same internal combustion engine, by its very proliferation, would bring not demise but reincarnation to the railway system. When the roads became saturated people turned again to rail.

Thanks to the co-operation of French transport and railway authorities Robert Adley has been able to compare the way in which the French have gone about their railway business wthout the "benefit of a Docteur Beeching." He says successive French governments have remained committed to their railway system investing in rail motorways while Britain fidded and fumbled with the Advanced Passenger Train concept finally starving it to death through lack of funds.

It is not only the author's pen, but also his camera which makes his book an unusual combination of words and pictures.

Colour photographs include coverage of the declining steam fleet of the 1960's as well as prototype diesels, the early successors to steam which are now of great historical interest.

Robert Adley does not always please his historical colleagues with his controversial comments. This book puts his comment to rail well ahead of his adherence to political views. It creates a rare combination of railway politics and nostalgia.

Lord Beeching, whom he canes in a typical political style, was a scientist-cum-civil-servant-cum-businessman (now deceased) "translated" by Transport Minister Ernest Marples from Technical Director of ICI into the chairmanship of the British

Transport Commission. His name, says the author, has become an established word in the English dictionary, albeit frequently adjectivally attached to words like "axe."

The reader is left wondering just how much of this emotional criticism of Lord Beeching's report is tonque-in-cheek, how much of it is reflective of contemporary attitudes and whether it is deliberately used as a vehicle to stimulate serious thought and discussion about the future role of rail in transport.

When Lord Beeching assumed overall control of Britain's railways in 1961 the end was near anyway for the benevolent post-nationalisation style of management which had existed in Britain since the demise of the "Big Four" lines following the state's takeover and the formation of British Railways.

Out Of Steam first published 1990 (review copy from Collins Angus and Robertson, North Ryde, NSW) is available from most major bookshops.
ISBN 1-85260-202-3.

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The first 21 pages are devoted to highlights of the year in retrospect from both the national and State viewpoints.

The ensuing sections on Australian National and the State rail services include tabulated statistical information covering the total length and gauge of track, number of cars, wagons and locomotives, and tonnage for principal commodities. The outstanding contribution which rail makes to the economy of each State thus is well documented.

Finally, the inside back cover contains summary information on privately-owned railways in Australia. These are operated mainly by the major mining corporations.

To sum up, if you want to know who currently is holding senior positions in rail, and all about the year's operations in rail transport the *ROA 1991 Year Book and Personnel Directory* is an essential reference. It is factual and authoritative. Available from Railways of Australia (Services) Pty Ltd, 4th Floor, 85 Queen Street, Melbourne 3000. □

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In the listings of manufacturers etc, the entries are comprehensive and detailed, country by country — Australia fares well although some changes have already taken place in some sectors.

Overall *Railway Directory 1991* is an outstanding reference guide that deserves a place in the library of all railway systems and manufacturers.

The price of £59 including airmail postage to Australia (A$155) is not a bargain, but is relevant to the detailed accuracy of the directory's contents. Published by Reed Business Publishing Ltd., Quadrant House, The Quadrant, Surrey. SM2 5AS, U.K.

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